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A COMPILATION OF SPACECRAFT LOADS DATA
FROM
FOUR TITAN CENTAUR LAUNCH VEHICLE FLIGHTS
VOLUME IV
TITAN STAGE I & CENTAUR FIRST BURN OSCILLATIONS

Compiled by George Kachadourian

(NASA-CR-144947-Pt-2) A COMPILATION OF
SPACECRAFT LOADS DATA FROM FOUR TITAN
CENTAUR LAUNCH VEHICLE FLIGHTS. VOLUME 4.
PART 2: TITAN STAGE 1 AND CENTAUR FIRST
BURN OSCILLATIONS (General Electric Co.)

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VOLUME IV

TITAN STAGE 1 AND CENTAUR FIRST BURN OSCILLATIONS

Section 2

TC-4/VIKING MISSION A DATA

Launch Date August 20, 1975

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Contents Description - Section 2: TC-4 - Viking A Data

This section presents Power Spectral Density (PSD) plots of the parameters listed below for representative periods of time during Titan Stage 1 Burn and Centaur Main Engine First Burn. Both two and four second samples digitized at 1024 samples per second were analyzed as noted, the four second sample to provide a finer frequency resolution. The primary objective of the analysis was to show frequency content.

A summary matrix of analyses performed is shown in Table 1. Table 2 presents a list of instrumentation and Figure 1 shows instrument locations.

The terms POGO and FLMN used in this report refer to longitudinal oscillation during Titan Stage 1 burn in the First Longitudinal Mode. POGO implies a sustained oscillation in a limit-cycle unstable condition. FLMN implies a random noise occurrence of the longitudinal mode excited by roughness in the engine burn.

Parameters for Which Analyses were Performed

Parameter	Description
CY182Ø CY183Ø CY184Ø CY185Ø	Vibration measurements on the Viking Orbiter Bus; CY183Ø is transverse, all others are longitudinal.
CY186S CY187S CY188S CY189S CY190S CY191S	Strain gage measurements, one on each of the six members of the Viking Lander Capsule Adapter (VLCA)
XDDL YDDL ZDDL	Acceleration of the Viking Lander Capsule (VLC) c. g. obtained through transformation of VLCA strain data assuming rigid VLC (Strain data is phase correlated to 40 Hz)
ZDDB	Average of phase correlated longitudinal vibration measurements on the VO Bus

Table 2.1 - Data Analysis Matrix - TC-4

Event & Time	IRIG No. Sensor No.	18 CY- 1820	17 CY- 1830	16 CY- 1840	15 CY- 1850	14 CY- 186S	13 CY- 187S	12 CY- 188S	11 CY- 189S	10 CY- 190S	9 CY- 191S	\ddot{X}_L	\ddot{Y}_L	\ddot{Z}_L	\ddot{Z}_B
FLMN-1 (T+220.5- 77140-77142.5 222.5)		X	X	X	X							X	X	X	X
FLMN-2 (T+233-T+235) 77153-77155		X	X	X	X							X	X	X	X
FLMN-3 (T+256-T258) 77176-77178		X	X	X	X							X	X	X	X
Cent. Burn 1-0.4 (Pre Steer) 77406.5-77410.5		X	X	X	X							X	X	X	X
Cent. Burn 1 - 1.4 77412-77416		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cent. Burn 1-2.4 77423.5-77428.5		X	X	X	X	X	X	X	X	X	X	X	X	X	X

X = PSD analysis performed

Note: All data was digitized at 1024 samples per second; see Note A, Table 2.

Table 2.2 FM/FM TELEMETRY INSTRUMENTATION, 2208.5 MHz LINK (TC-4)

MEAS. NO.	DESCRIPTION	JPL DESIGNATION	RANGE		U N I T S	A C C U R A C Y	FM/FM CHANNEL	FILTER CUT OFF FREQUENCY - Hz	
			LOW	HIGH				A 1024 SPS	B 4096 SPS
CA886Y	Fwd.Equip.Comp.Amb.	-	120	150	db	5%	19	—	2800
CY182Ø	Longit.Vib; Foot H	2001AC1	-30	30	G	5%	18	133	2100
CY183Ø	Radial Vib.; Bay 7/8	2001AC2	-12	+12	G	5%	17	134	1580
CY184Ø	Longit. Vib., Foot C	2001AC3	- 5	+ 5	G	5%	16	135	1200
CY185Ø	Longit. Vib., Foot R	2001AC4	- 5	+ 5	G	5%	15	137	900
CY186S	VLCA #750 Strain 1	2001SG1	10000C	8000T	Lbs	5%	14	140	—
CY187S	VLCA #751 Strain 2	2001SG2	10000C	8000T	Lbs	5%	13	145	—
CY188S	VLCA #752 Strain 3	2001SG3	10000C	8000T	Lbs	5%	12	153	—
CY189S	VLCA #753 Strain 4	2001SG4	10000C	8000T	Lbs	5%	11	160	—
CY190S	VLCA #754 Strain 5	2001SG5	10000C	8000T	Lbs.	5%	10	180	—
CY191S	VLCA #755 Strain 6	2001SG6	10000C	8000T	Lbs.	5%	9	200	—
CY192P	VLC Bioshield DP		-0.25	0.75	PSID	5%	4	—	—
CY193P	VLC Bioshield Press.		0	16	PSIA	5%	3	—	—

① Range shown is max limit. Each gage will have a different range dependent on its calibration value.

A. This is a special set of filters which, in conjunction with discriminator characteristics, results in phase errors of less than 1° between VCO 9 through 18 below 40 Hz

B. These are twice the standard IRIG filter.

Table 2.3 TIME OF FLIGHT EVENTS: TC-4 Viking A Spacecraft

(8/20/75 Launch)

FLIGHT EVENT	Predicted Sec from LO	Actual Hrs Min Sec	Actual Seconds	From Stg O Ign Seconds	From Stg I Ign. Seconds	
1 STG O IGN. /LO	0	21:22.00. *	76920	0	-	
2 MACH I/MAX Q	50	21:22:38	76958	38	-	
3 FBR RELEASE	100	21:23:40.2	77020.2	100.2	-	
4 STG I IGN	110	21:23:50.6	77030.4	110.4	0	
5 JETT SRM	122	21:24:01.9	77041.9	121.9	11.5	
6a POGO - Typ TC-1	232	-	-	-	-	
6b POGO - Typ TC-2	250	-	-	-	-	
7 SI-BO/SII-IGN	259	21:26:19.5	77179.5	259.5	149.1	
8 JETT SHROUD	270	21:26:31.9	77191.9	271.9	161.5	
9 STG II BO	468	21:29:47.6	77387.6	467.6	357.2	
10 JETT STG II	474	21:29:57.0	77397.0	477.0	366.6	
11 MES-I	485	21:30:05.5	77405.5	485.5	375.1	
12 MECO-I	613	21:32:11.3	77531.3	611.3	500.9	
13 MES-II	1824	21:47:31.2	78451.2	1531.2	1420.8	
14 MECO-II	2140	21:52:46.3	78766.3	1846.3	1735.9	
15 S/C SEP.	2360	21:56:30	78990	2070	1959.6	

*21:22:00 is instant of igniting : actual measured first motion occurred at 21:22:00.632

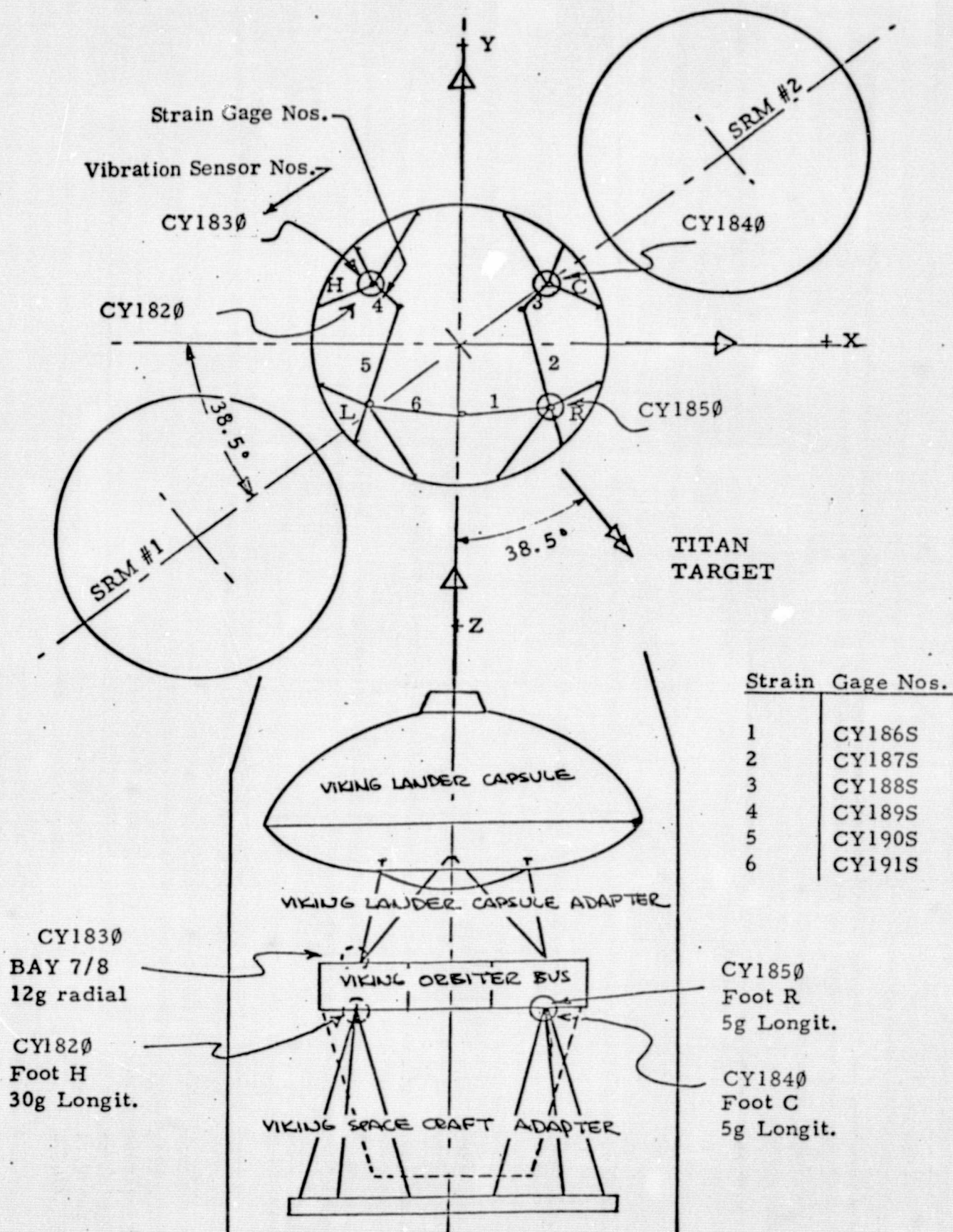
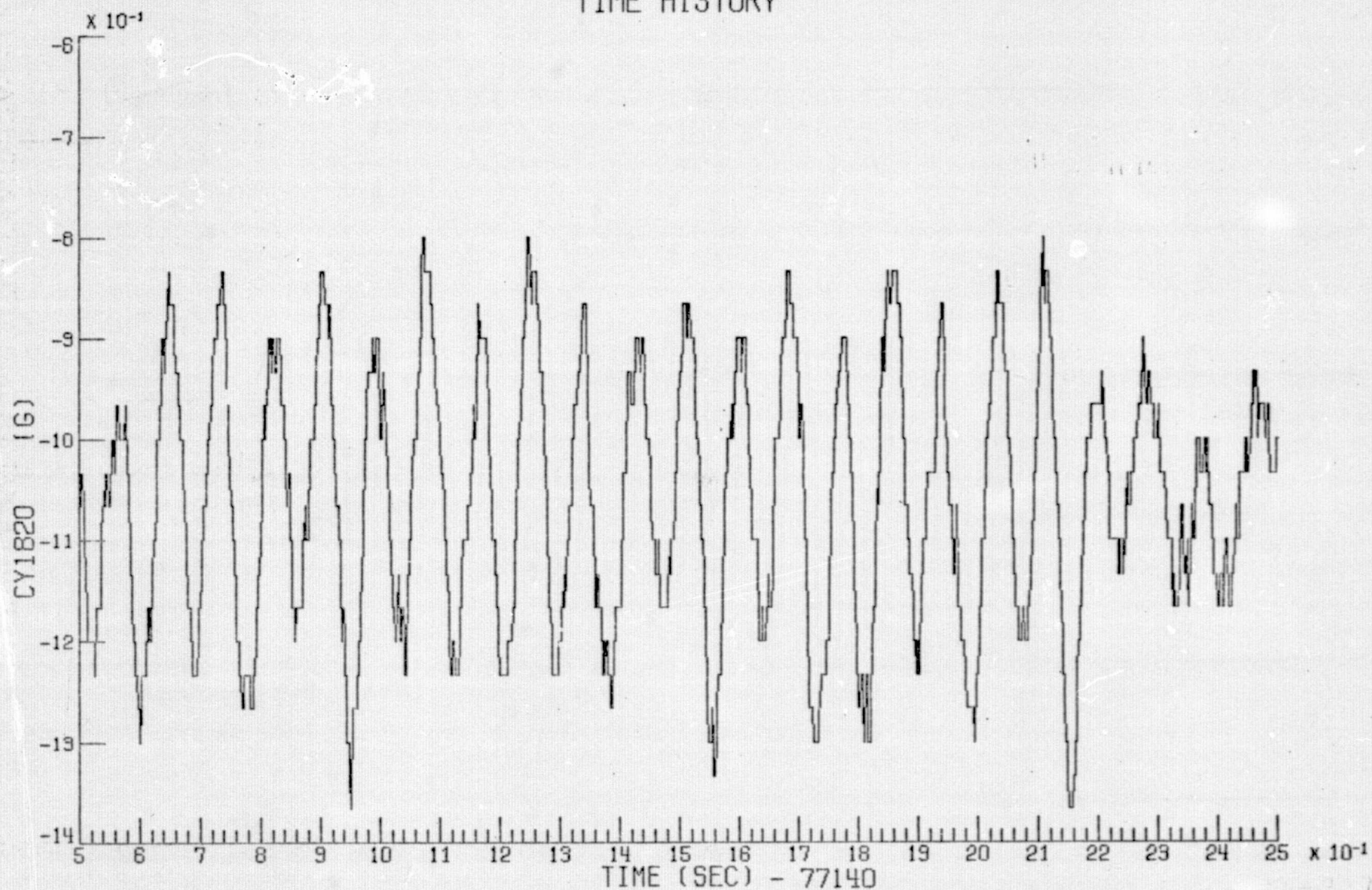


FIGURE 2.1 VIKING SPACECRAFT INSTRUMENT LOCATIONS

TIME HISTORY

2.7



MAX = -.800

MIN = -1.366 → ± .283

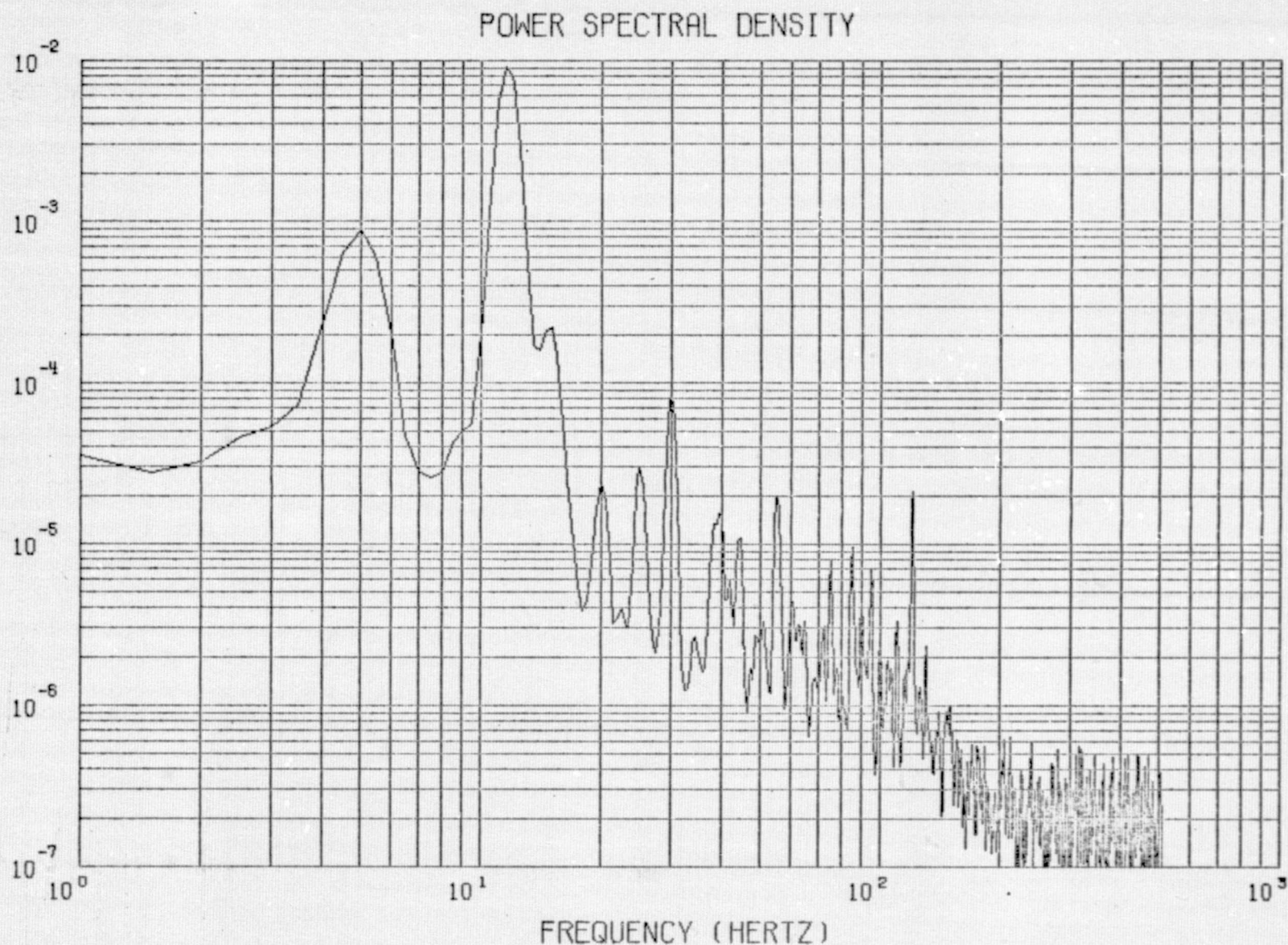
VIKING A FLT (CIF)

POGO

CY1820

2.2

PSD CY1820 (G SQ / HERTZ)



$\Delta F = .500$

START = 77140.500 SEC

STOP = 77142.500 SEC

MEAN = -10596×10^{-9}

$\sigma^2 = 16152 \times 10^{-5}$

$\sigma = 12709 \times 10^{-5}$

$3\sigma = 38127 \times 10^{-5}$

VIKING A FLT (CIF)

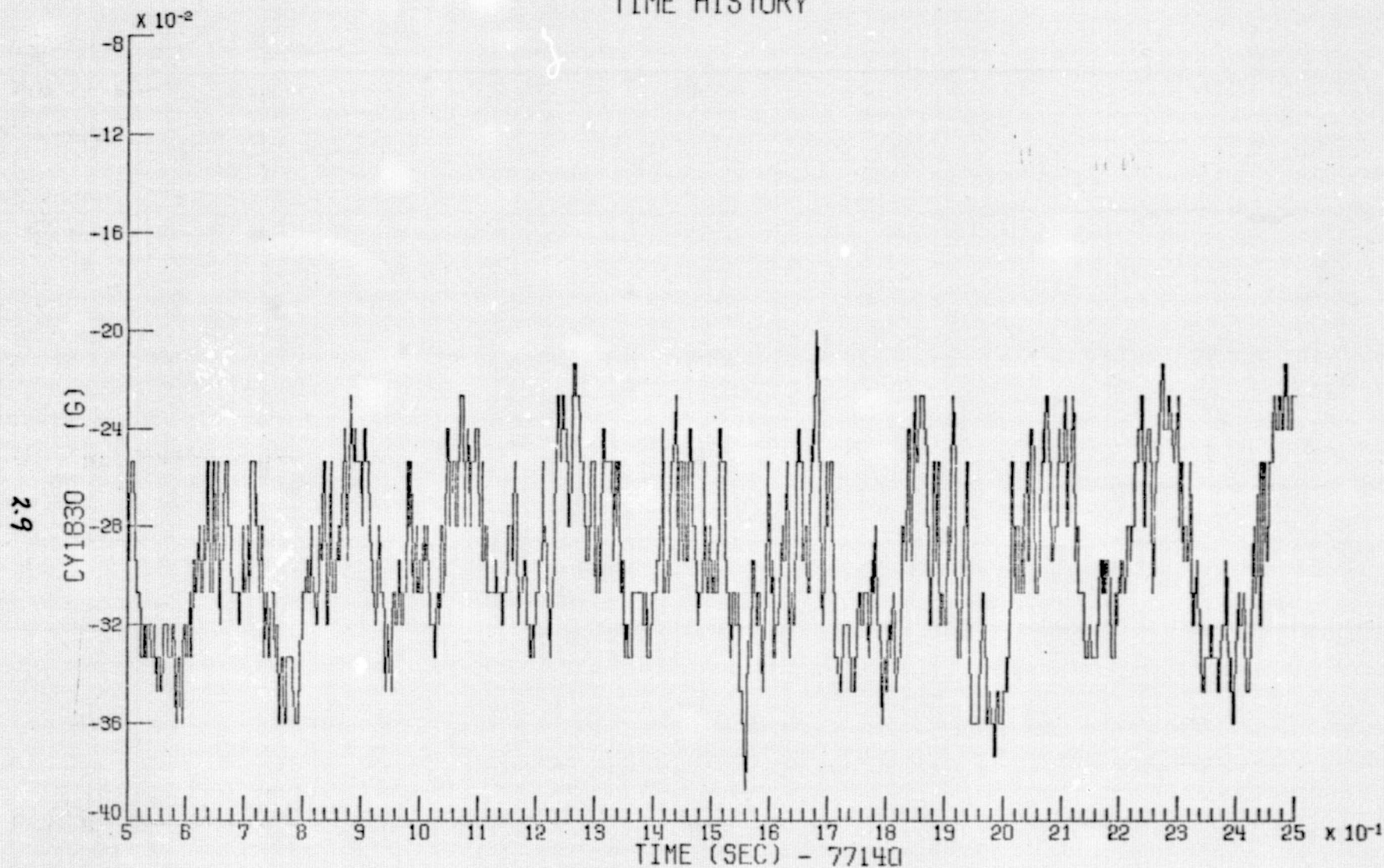
POGO

CY1820

NASA-LANGLEY SIGNAL ANALYSIS PROGRAM 08/21/75

FIGURE 2.2b

TIME HISTORY



MAX = -.200

MIN = -.336

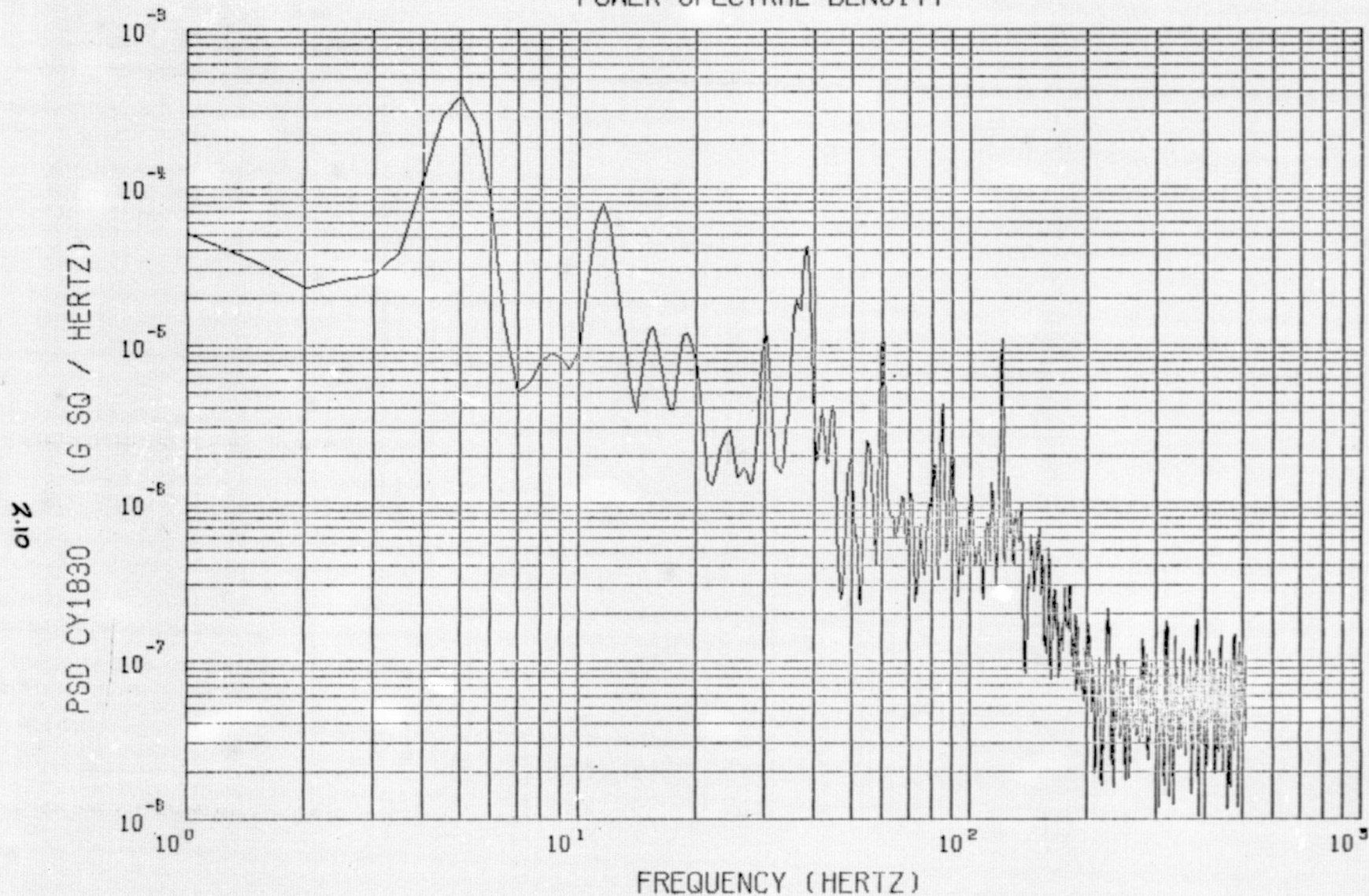
→ ±.093 g

VIKING A FLT (CIF)

POGO

CY1830

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77140.500 SEC

STOP = 77142.500 SEC

MEAN = -29406×10^{-5}

$\sigma^2 = 12118 \times 10^{-7}$

$\sigma = 34812 \times 10^{-8}$

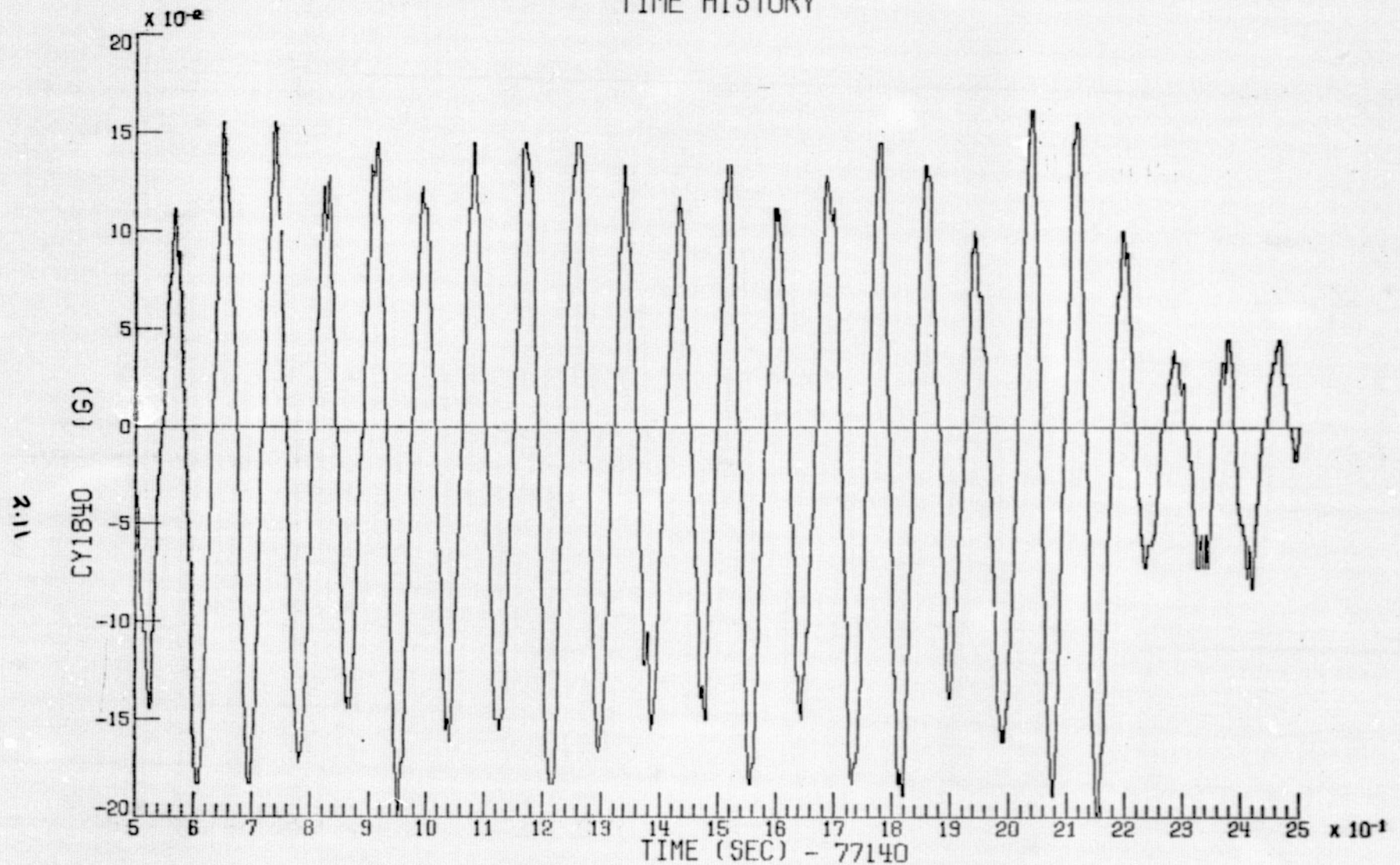
$3\sigma = 10443 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

CY1830

TIME HISTORY



MAX = .161

MIN = -.200

→ $\pm .1818$

VIKING A FLT (CIF)

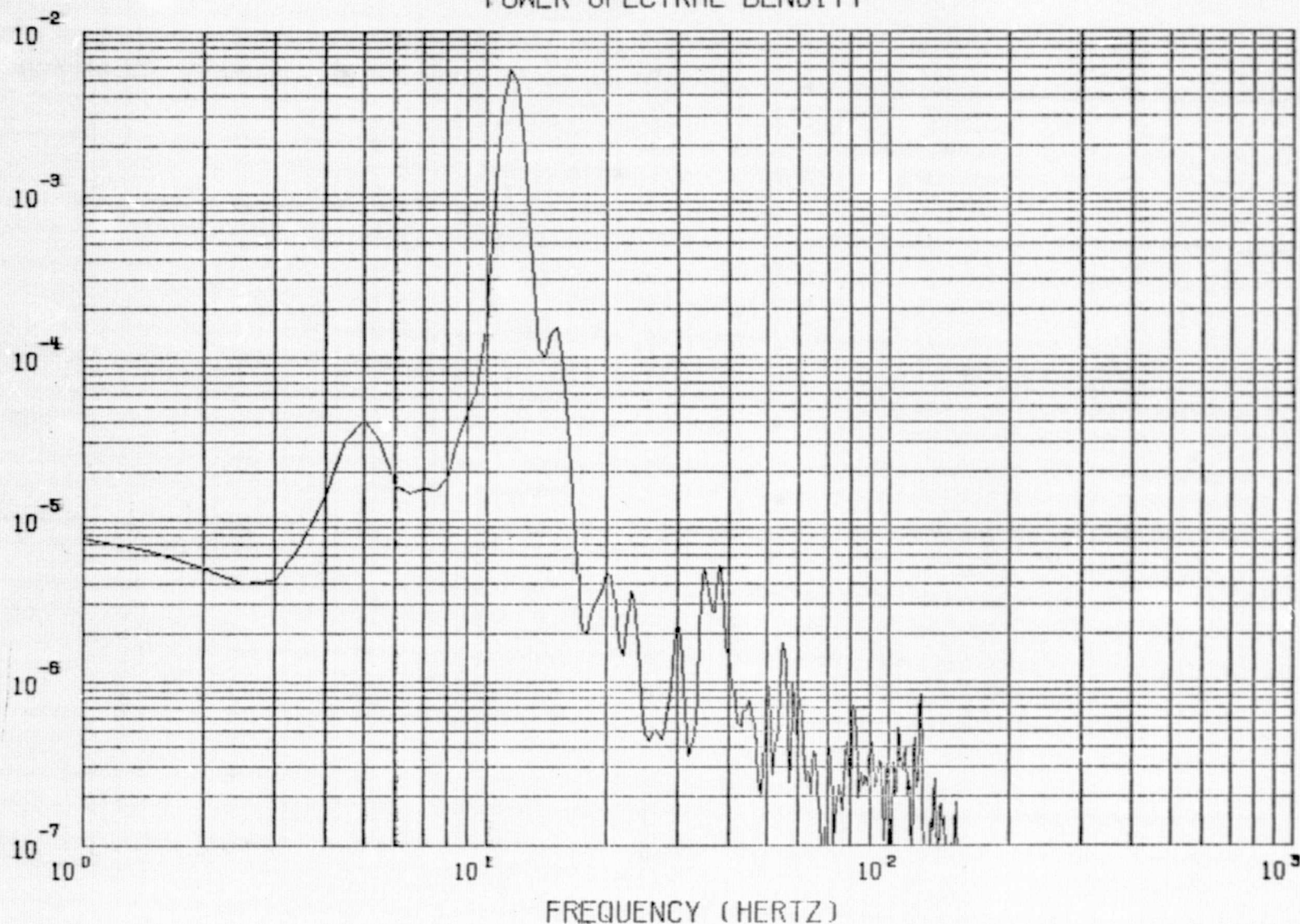
POGO

CY1840

POWER SPECTRAL DENSITY

2.12

PSD CY1840 (G SQ / HERTZ)



$\Delta F = .500$

START = 77140.500 SEC

STOP = 77142.500 SEC

MEAN = -17364×10^{-6}

$\sigma^2 = 92199 \times 10^{-7}$

$\sigma = 9602 \times 10^{-5}$

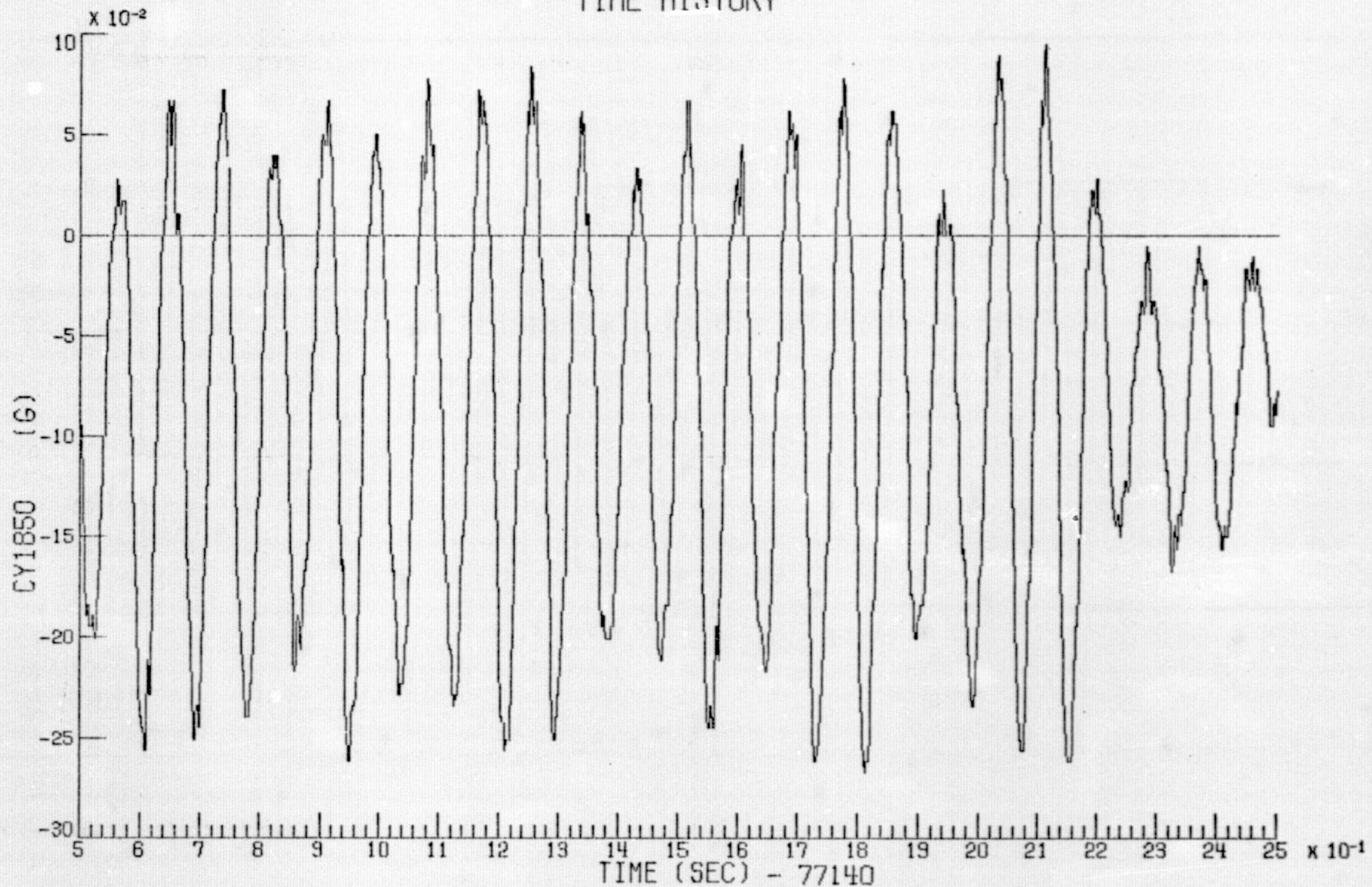
$3\sigma = 28806 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

CY1840

TIME HISTORY



MAX = .094

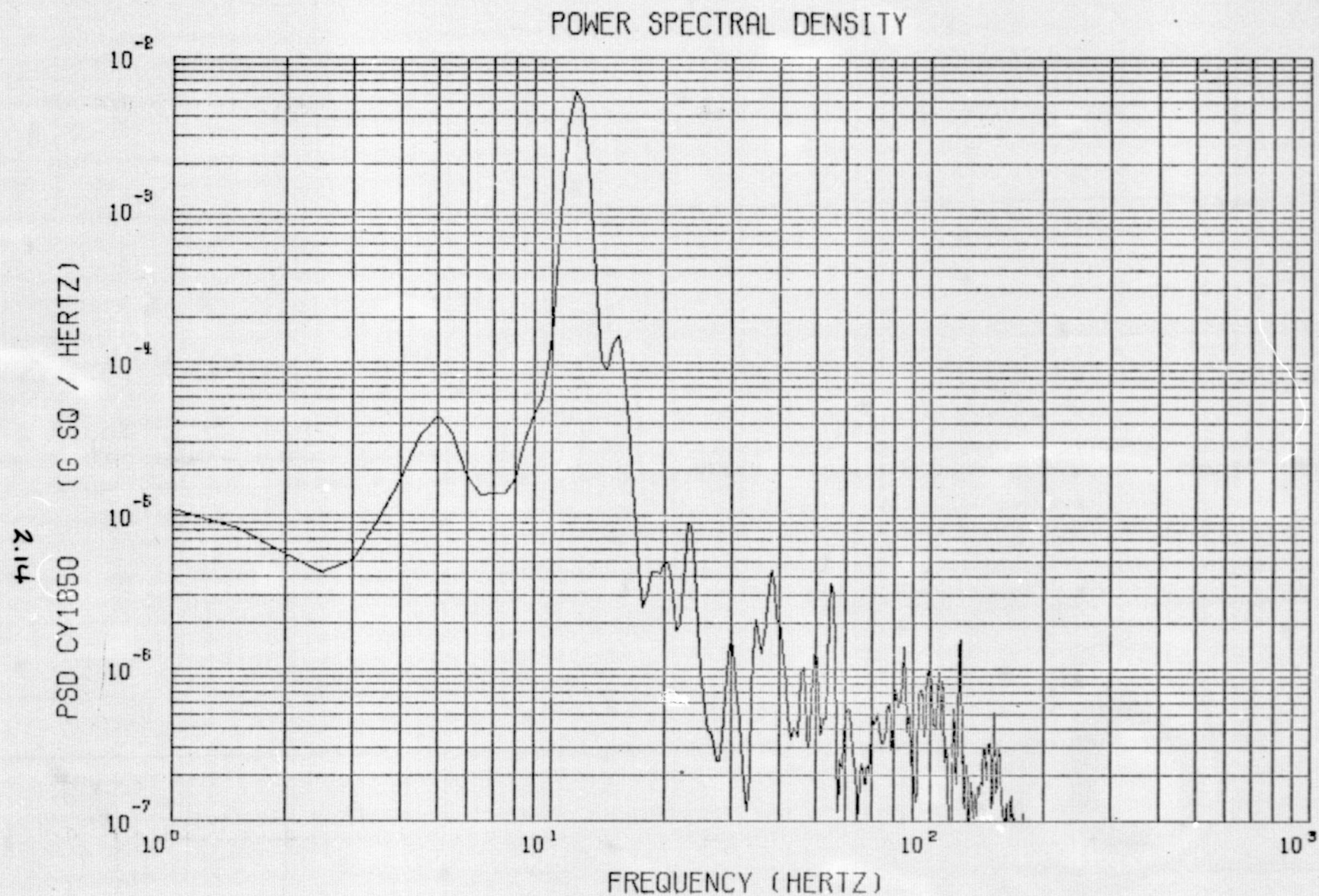
MIN = -.267

$\rightarrow \pm .1768$

VIKING A FLT (CIF)

POGO

CY1850



$\Delta F = .500$

START = 77140.500 SEC

STOP = 77142.500 SEC

MEAN = -86588×10^{-5}

$\sigma^2 = 93932 \times 10^{-7}$

$\sigma = 96949 \times 10^{-5}$

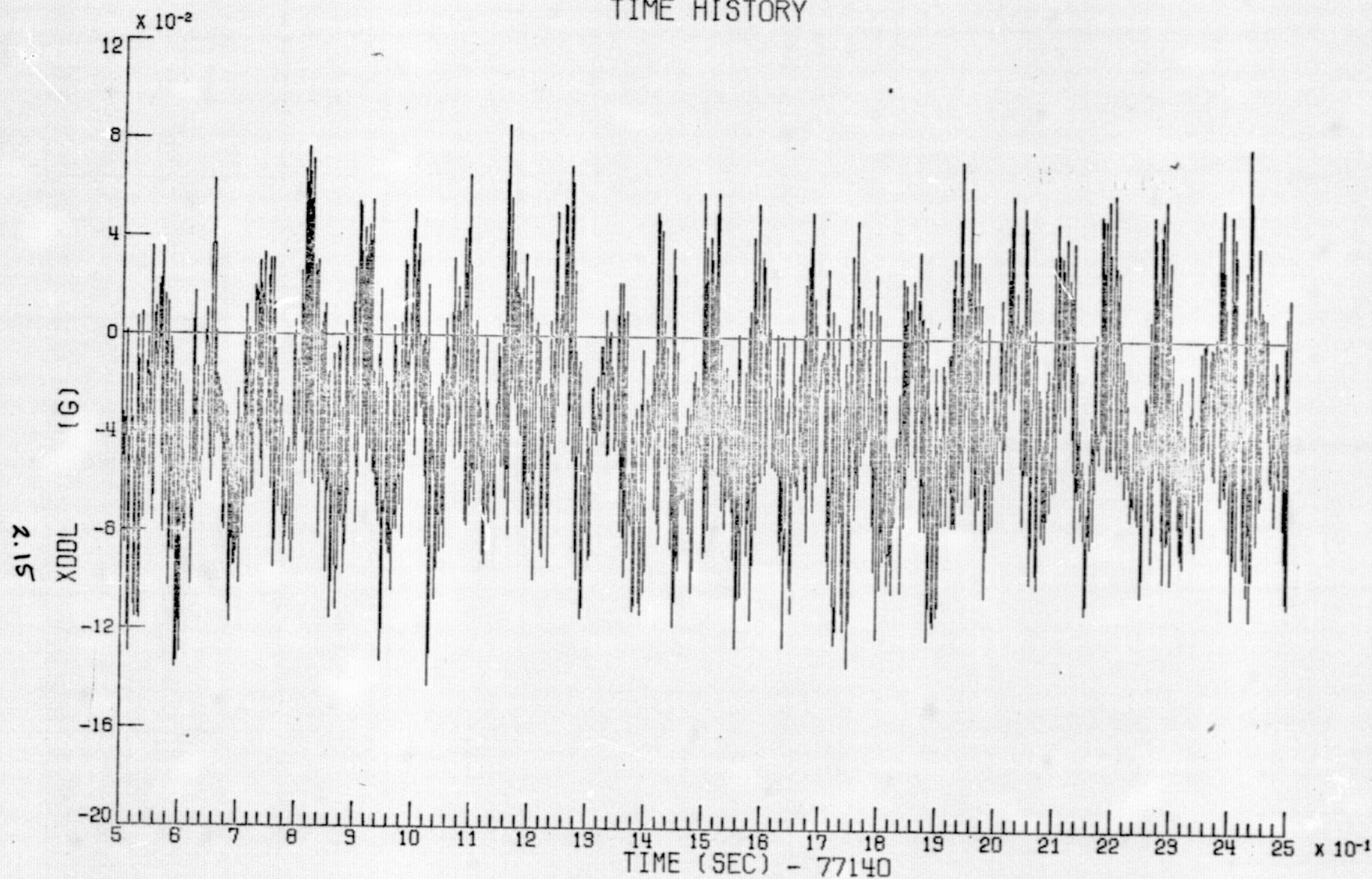
$3\sigma = 29084 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

CY1850

TIME HISTORY



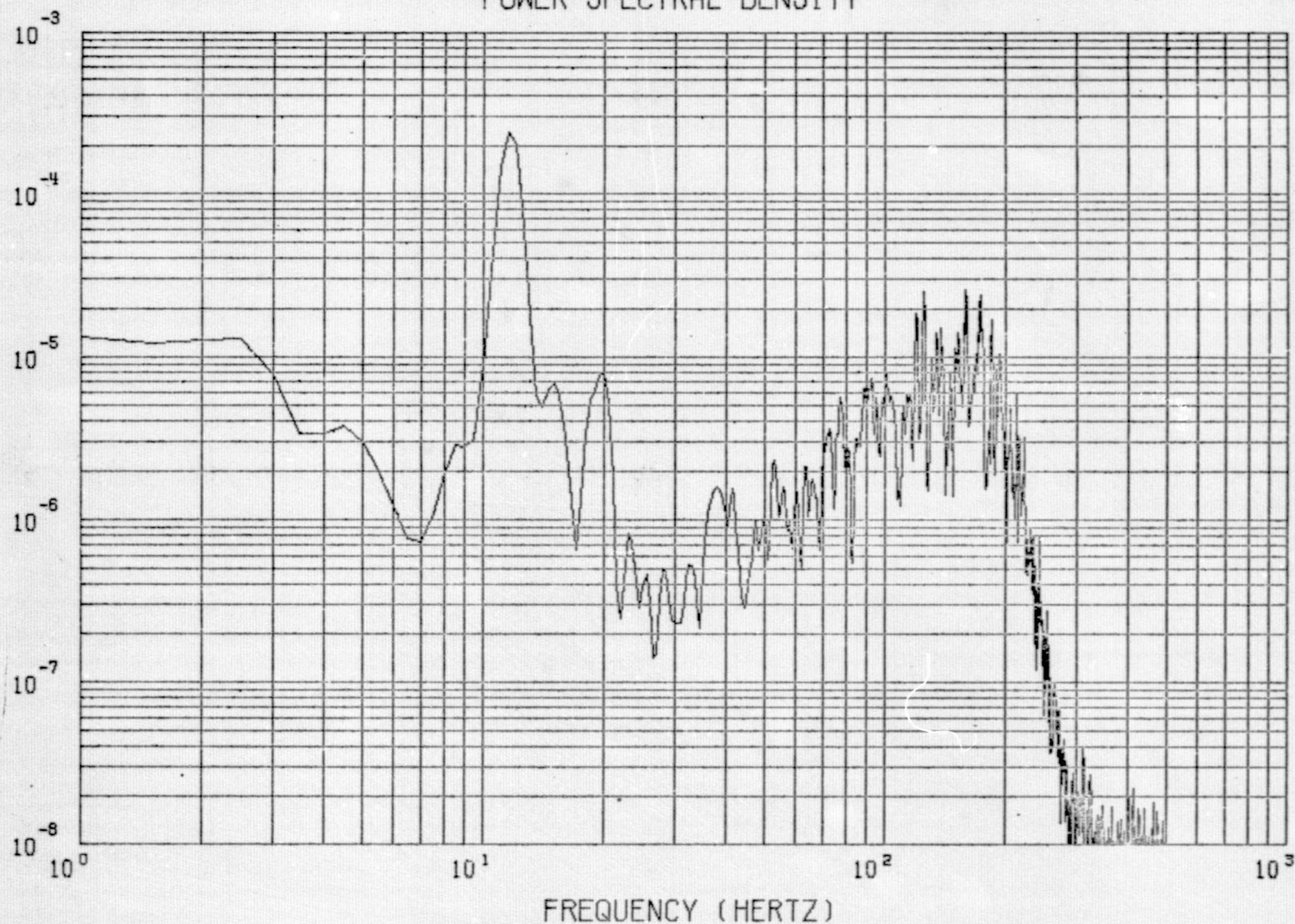
VIKING A FLT (CIF)

POGO

XDDL

POWER SPECTRAL DENSITY

2.16
PSD XDDL (G SQ / HERTZ)



$\Delta F = .500$

START = 77140.500 SEC

STOP = 77142.500 SEC

MEAN = -33444×10^{-6}

$\sigma^2 = 14082 \times 10^{-7}$

$\sigma = 37527 \times 10^{-6}$

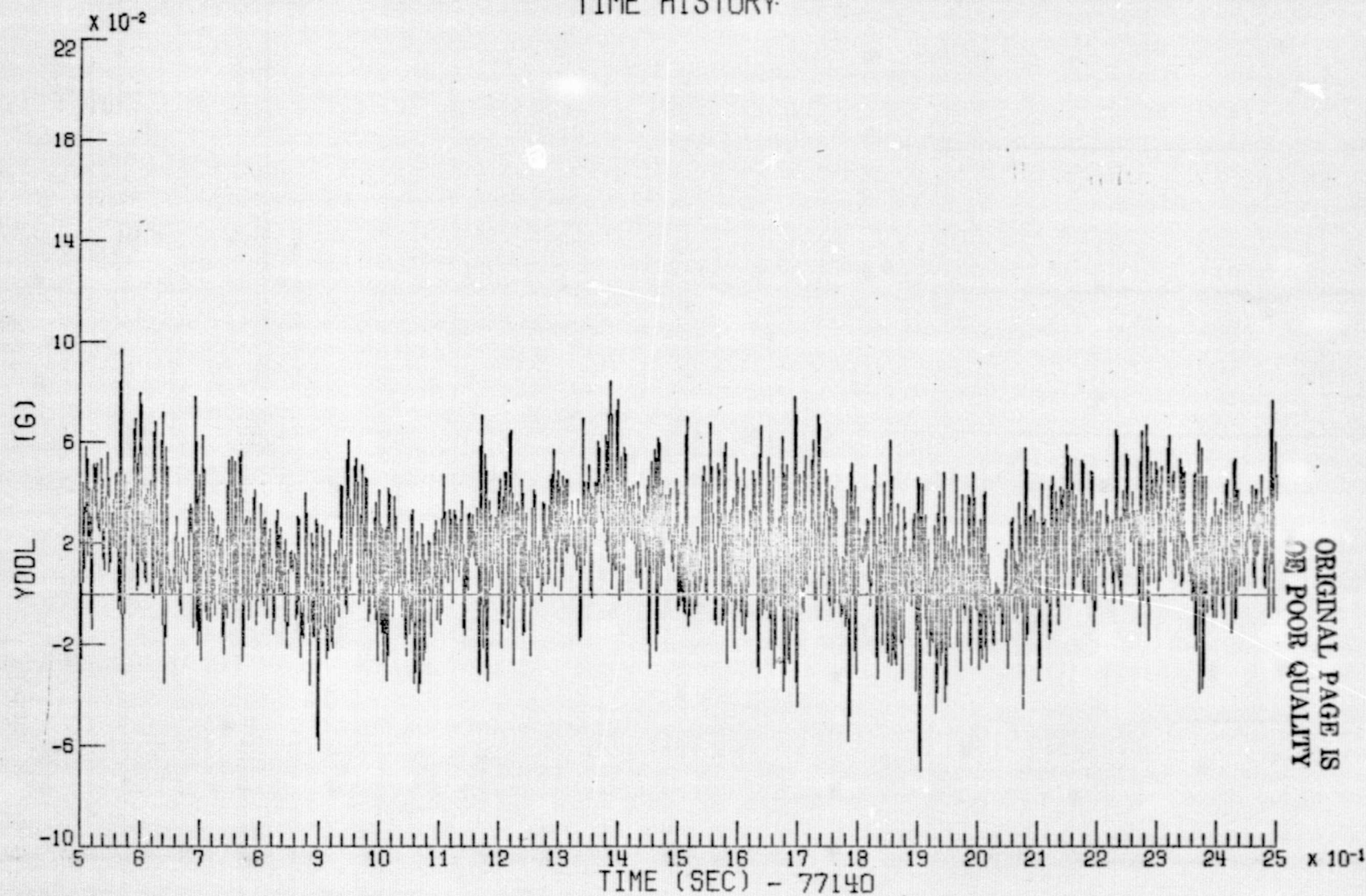
$3\sigma = 11258 \times 10^{-6}$

VIKING A FLT (CIF)

POGO

XDDL

TIME HISTORY



MAX = .097

MIN = -.070

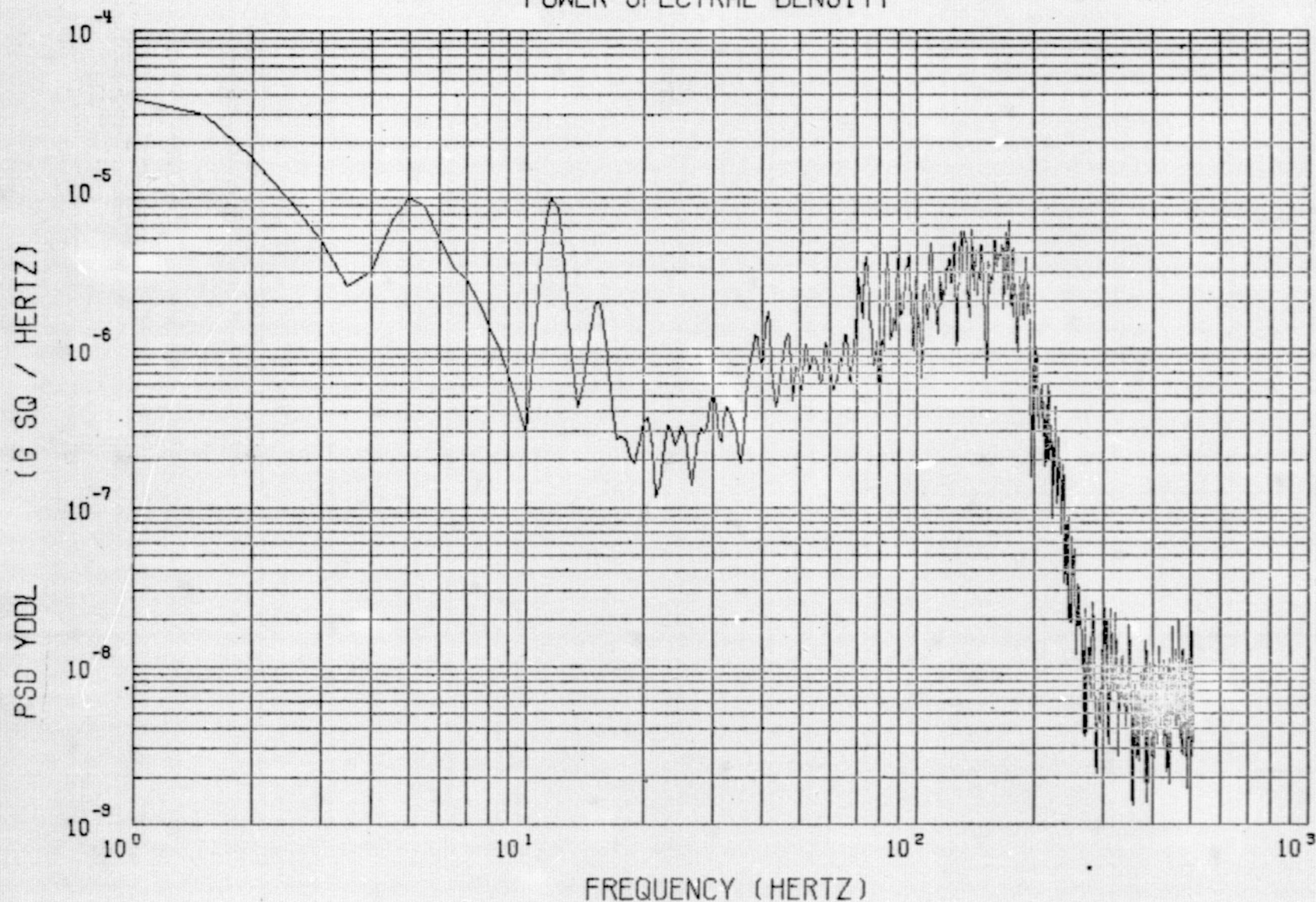
VIKING A FLT (CIF)

POGO

YDDL

POWER SPECTRAL DENSITY

2.18



$\Delta F = .500$

START = 77140.500 SEC

STOP = 77142.500 SEC

MEAN = 16689×10^{-5}

$\sigma^2 = 48172 \times 10^{-6}$

$\sigma = 21948 \times 10^{-6}$

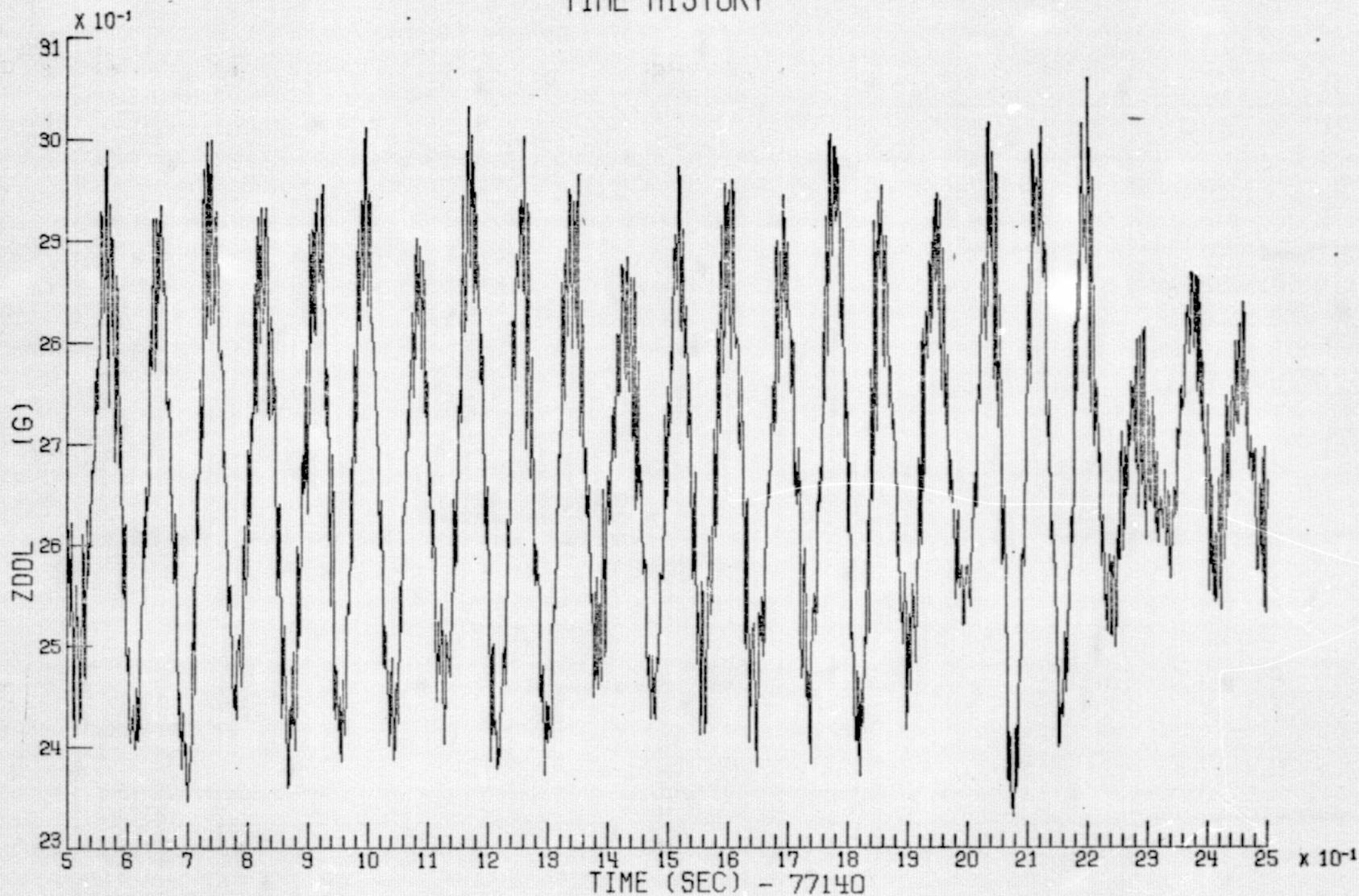
$3\sigma = 65844 \times 10^{-6}$

VIKING A FLT (CIF)

POGO

YDDL

TIME HISTORY



MAX = 3.059

MIN = 2.330

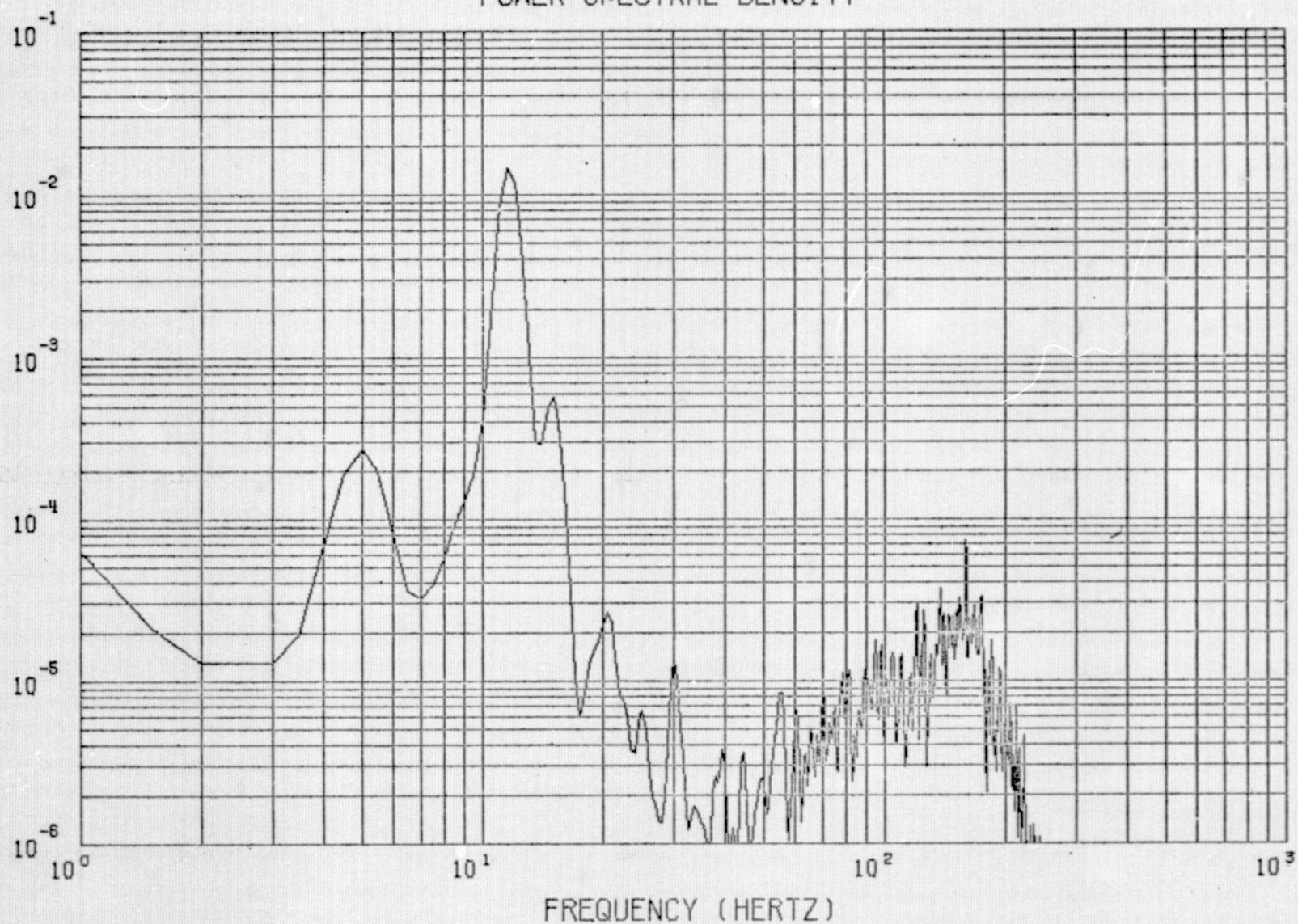
VIKING A FLT (CIF)

POGO

ZDDL

POWER SPECTRAL DENSITY

2.20
PSD ZDDL
(G SQ / HERTZ)



$\Delta F = .500$

START = 77140.500 SEC

STOP = 77142.500 SEC

MEAN = 26745×10^{-4}

$\sigma^2 = 25872 \times 10^{-5}$

$\sigma = 16084 \times 10^{-5}$

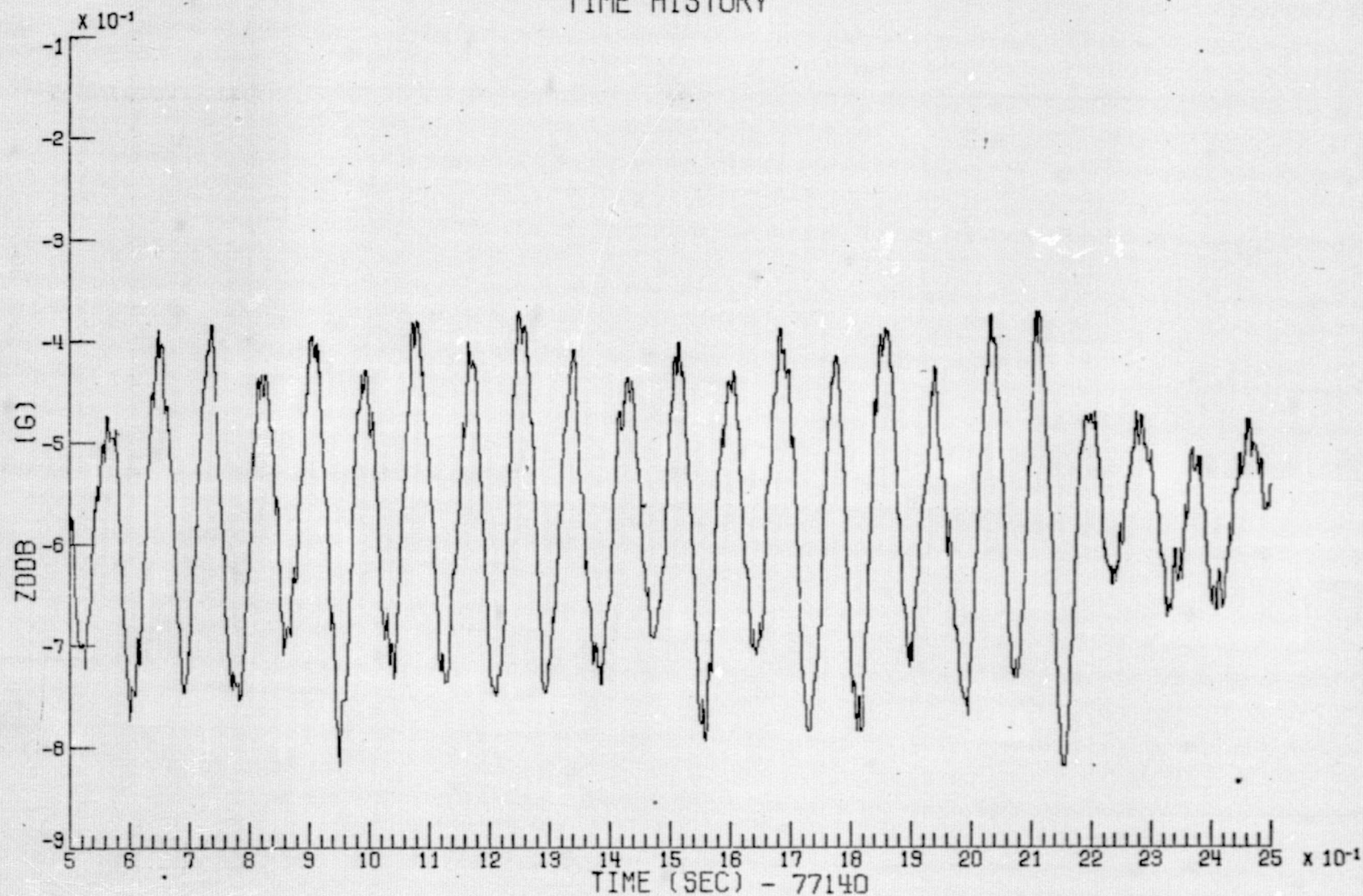
$3\sigma = 48254 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

ZDDL

TIME HISTORY



MAX = -.372

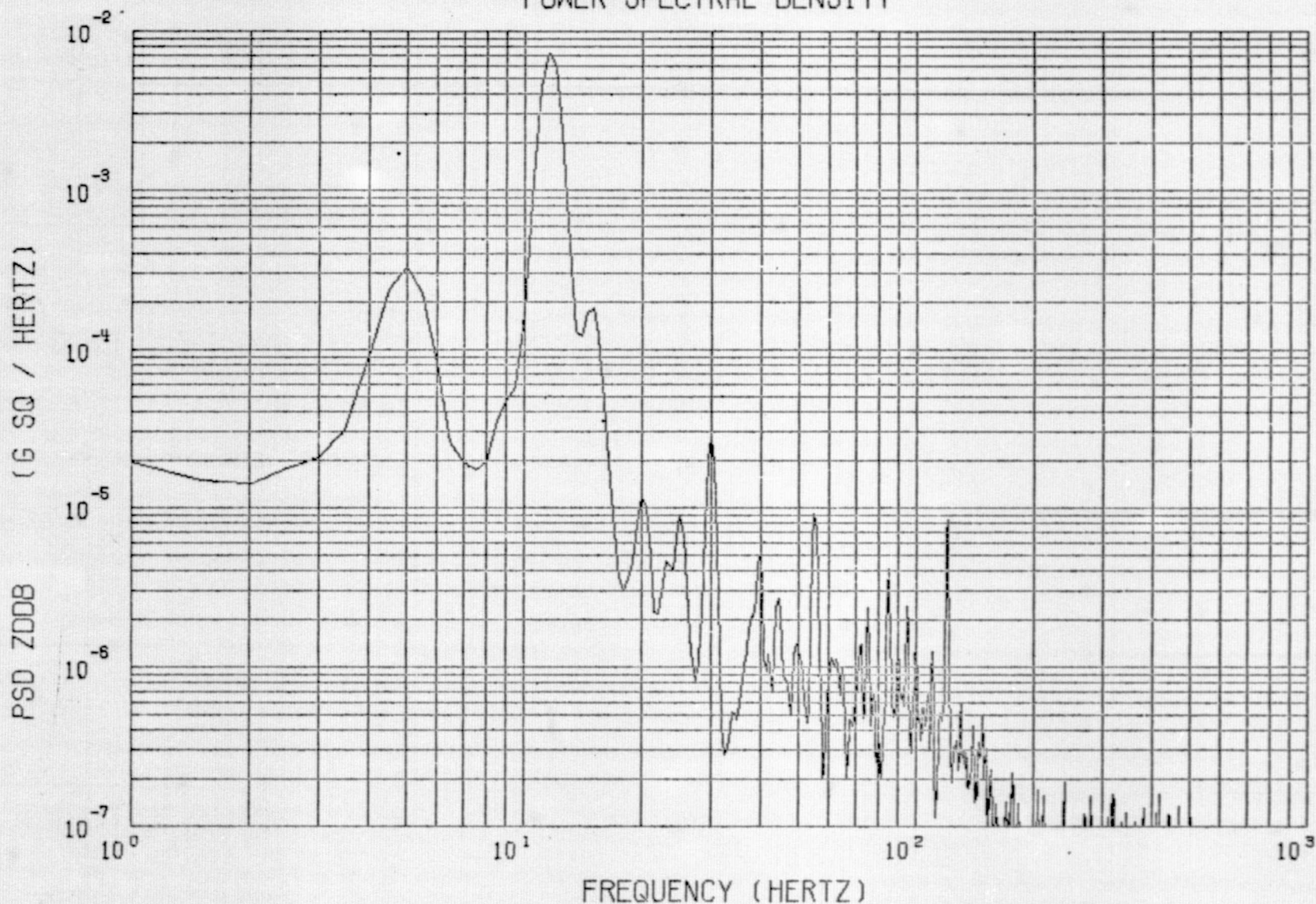
MIN = -.818

VIKING A FLT (CIF)

POGO

ZODB

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77140.500 SEC

STOP = 77142.500 SEC

MEAN = -57695×10^{-6}

$\sigma^2 = 12253 \times 10^{-6}$

$\sigma = 11069 \times 10^{-6}$

$3\sigma = 33209 \times 10^{-6}$

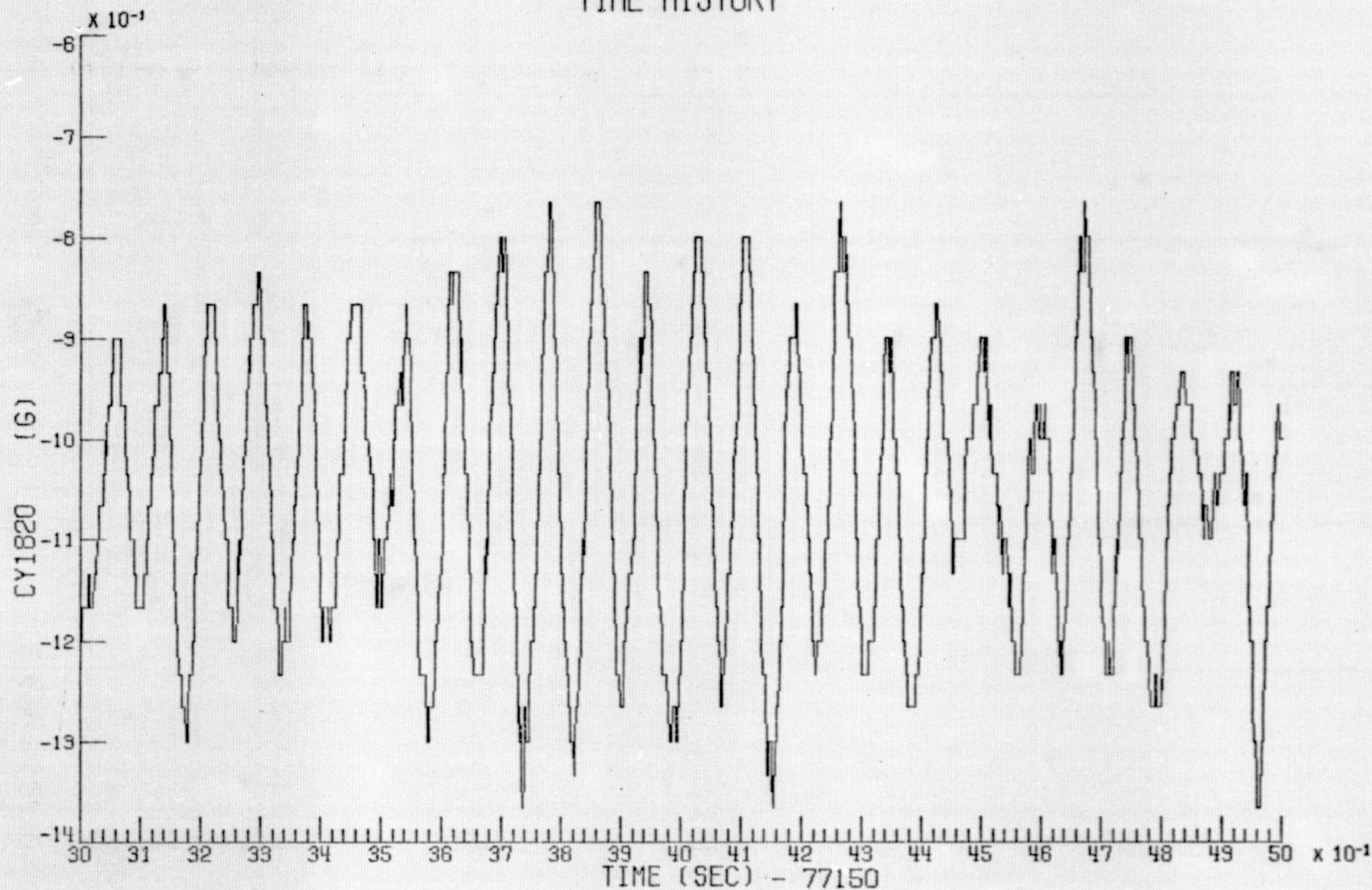
VIKING A FLT (CIF)

POGO

ZODB

TIME HISTORY

2.23



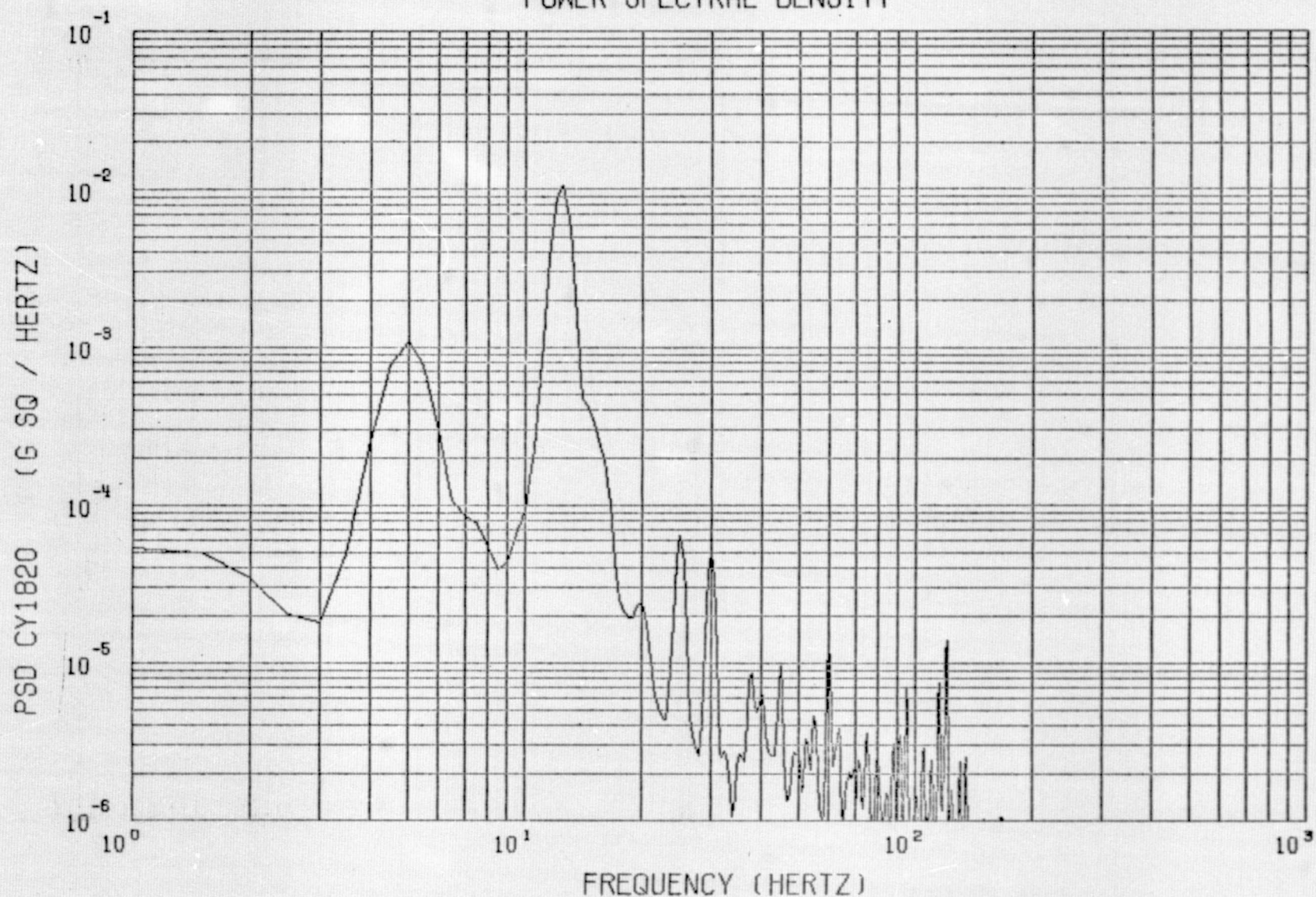
VIKING A FLT (CIF)

POGO

CY1820

POWER SPECTRAL DENSITY

224



$\Delta F = .500$

START = 77153.000 SEC

STOP = 77155.000 SEC

MEAN = -10557×10^{-4}

$\sigma^2 = 19221 \times 10^{-5}$

$\sigma = 13864 \times 10^{-5}$

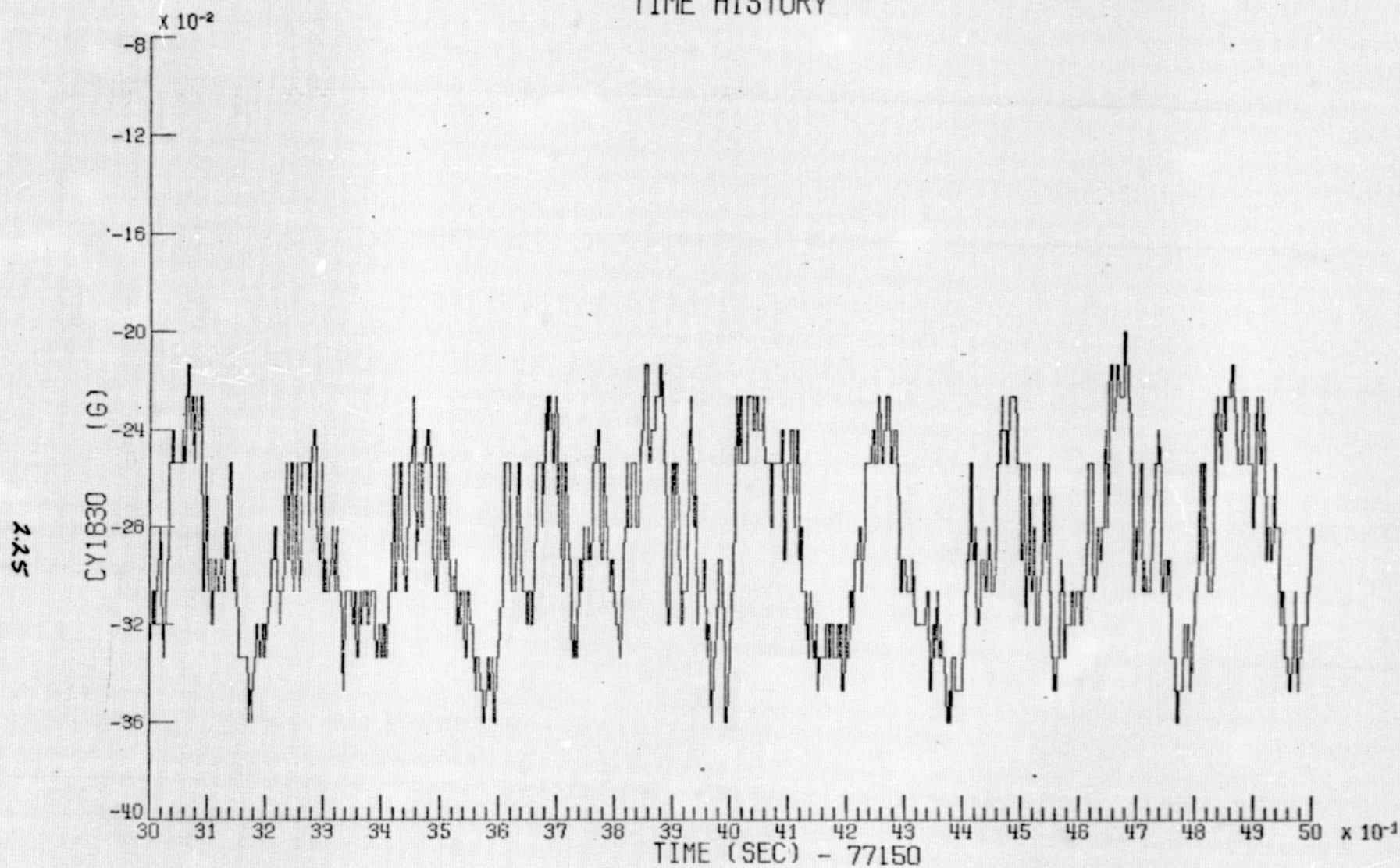
$3\sigma = 41592 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

CY1820

TIME HISTORY



MAX = -.200

MIN = -.360 $\rightarrow \pm .080$

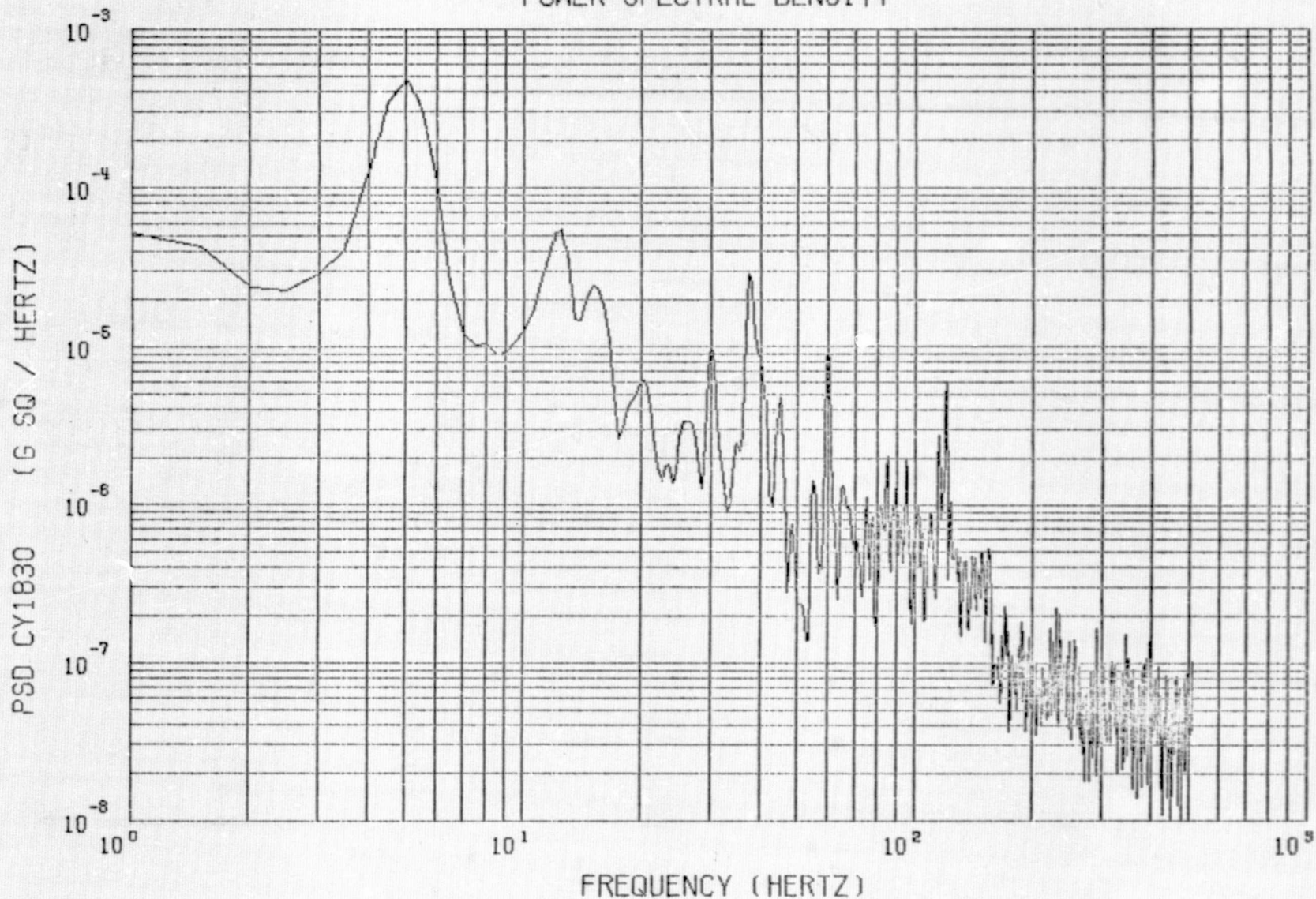
VIKING A FLT (CIF)

POGO

CY1830

POWER SPECTRAL DENSITY

2.2C



$\Delta F = .500$

START = 77153.000 SEC

STOP = 77155.000 SEC

MEAN = -28824×10^{-5}

$\sigma^2 = 12989 \times 10^{-7}$

$\sigma = 3604 \times 10^{-5}$

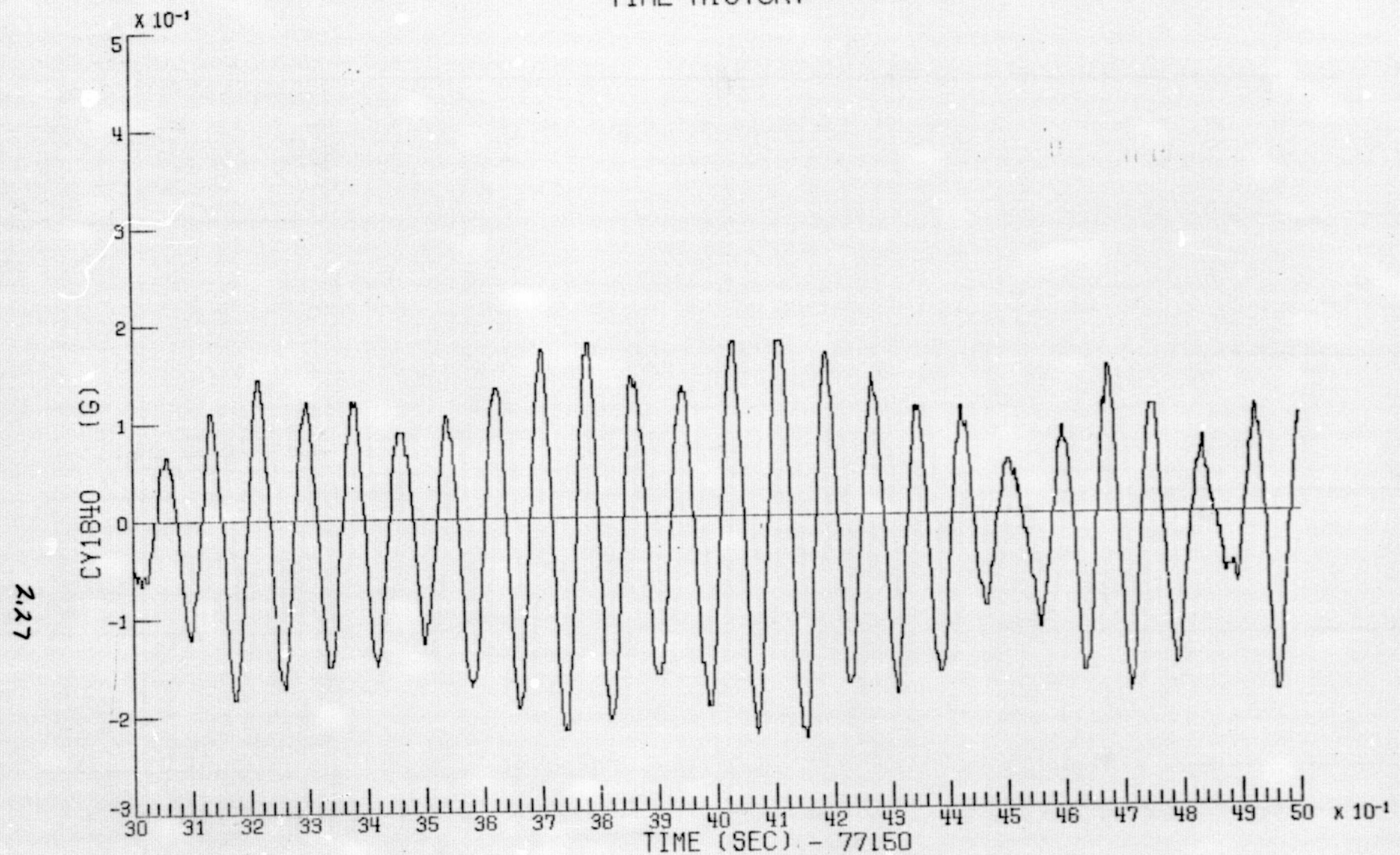
$3\sigma = 10812 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

CY1830

TIME HISTORY



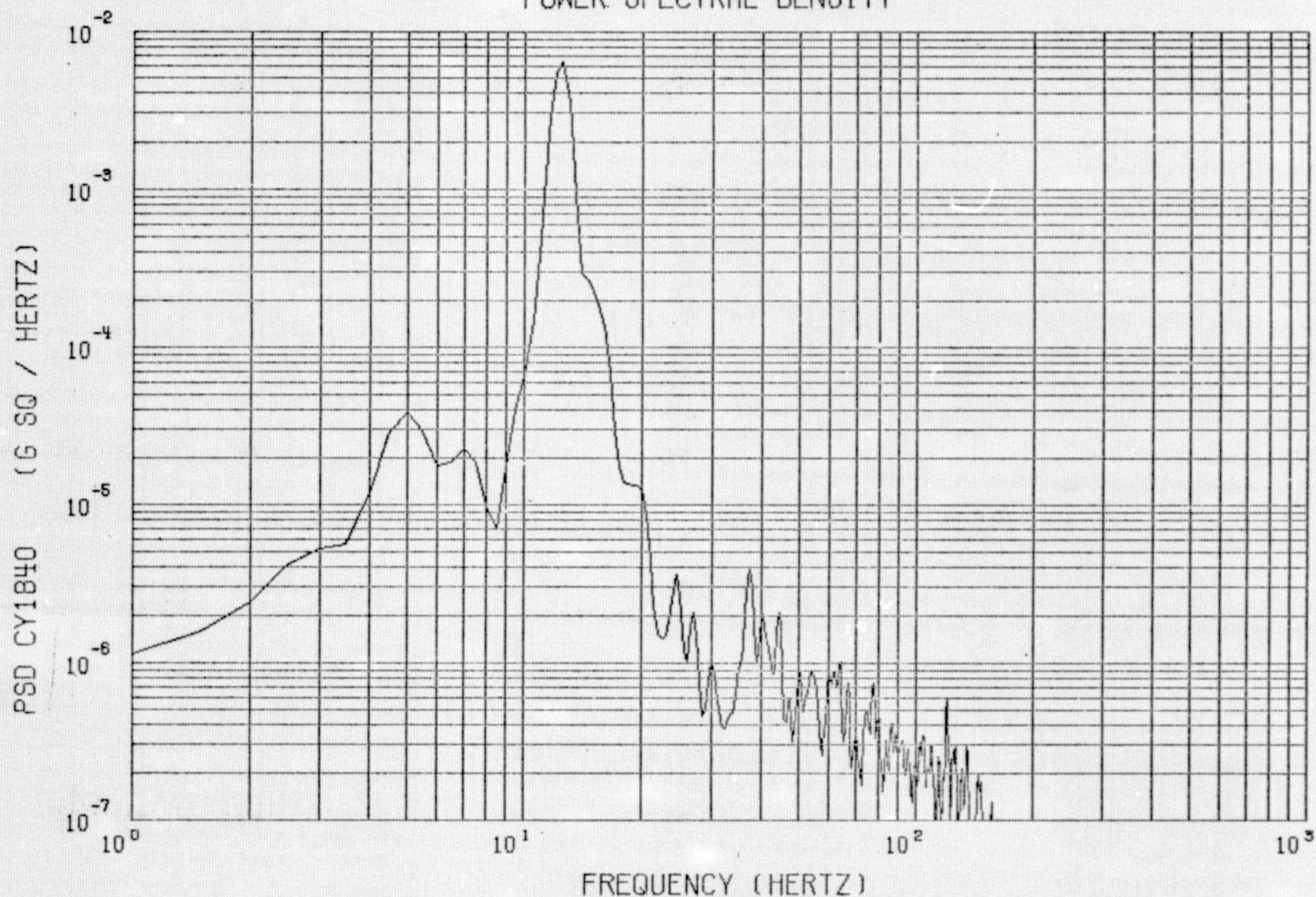
VIKING A FLT (CIF)

POGO

CY1840

POWER SPECTRAL DENSITY

2.28



$\Delta F = .500$

START = 77153.000 SEC

STOP = 77155.000 SEC

MEAN = -18042×10^{-5}

$\sigma^2 = 10493 \times 10^{-5}$

$\sigma = 10243 \times 10^{-5}$

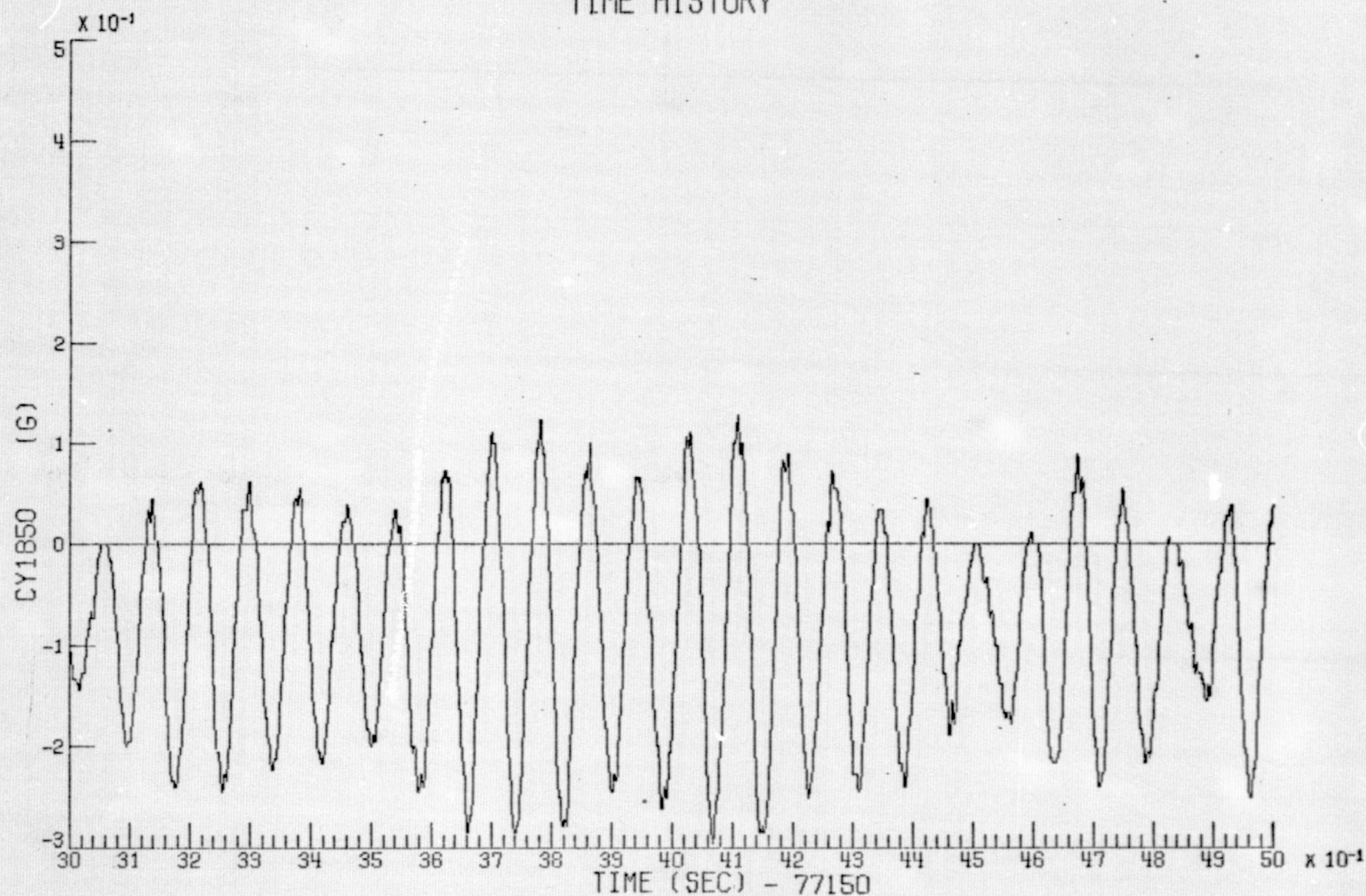
$3\sigma = 30731 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

CY1840

TIME HISTORY



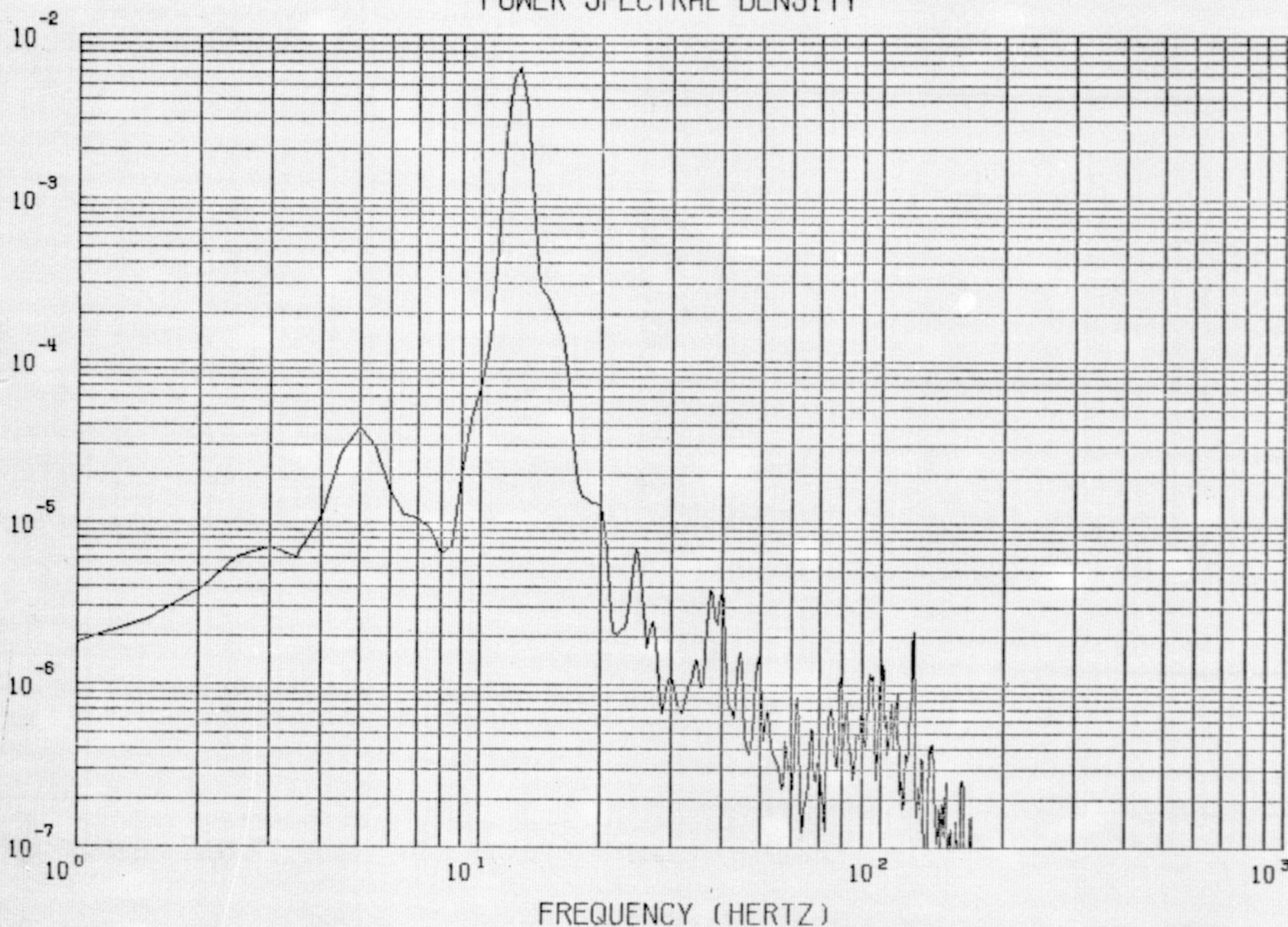
VIKING A FLT (CIF)

POGO

CY1850

POWER SPECTRAL DENSITY

PSD CY1850 (G SQ / HERTZ)



$\Delta F = .500$

START = 77153.000 SEC

STOP = 77155.000 SEC

MEAN = -85716×10^{-6}

$\sigma^2 = 10677 \times 10^{-6}$

$\sigma = 10333 \times 10^{-5}$

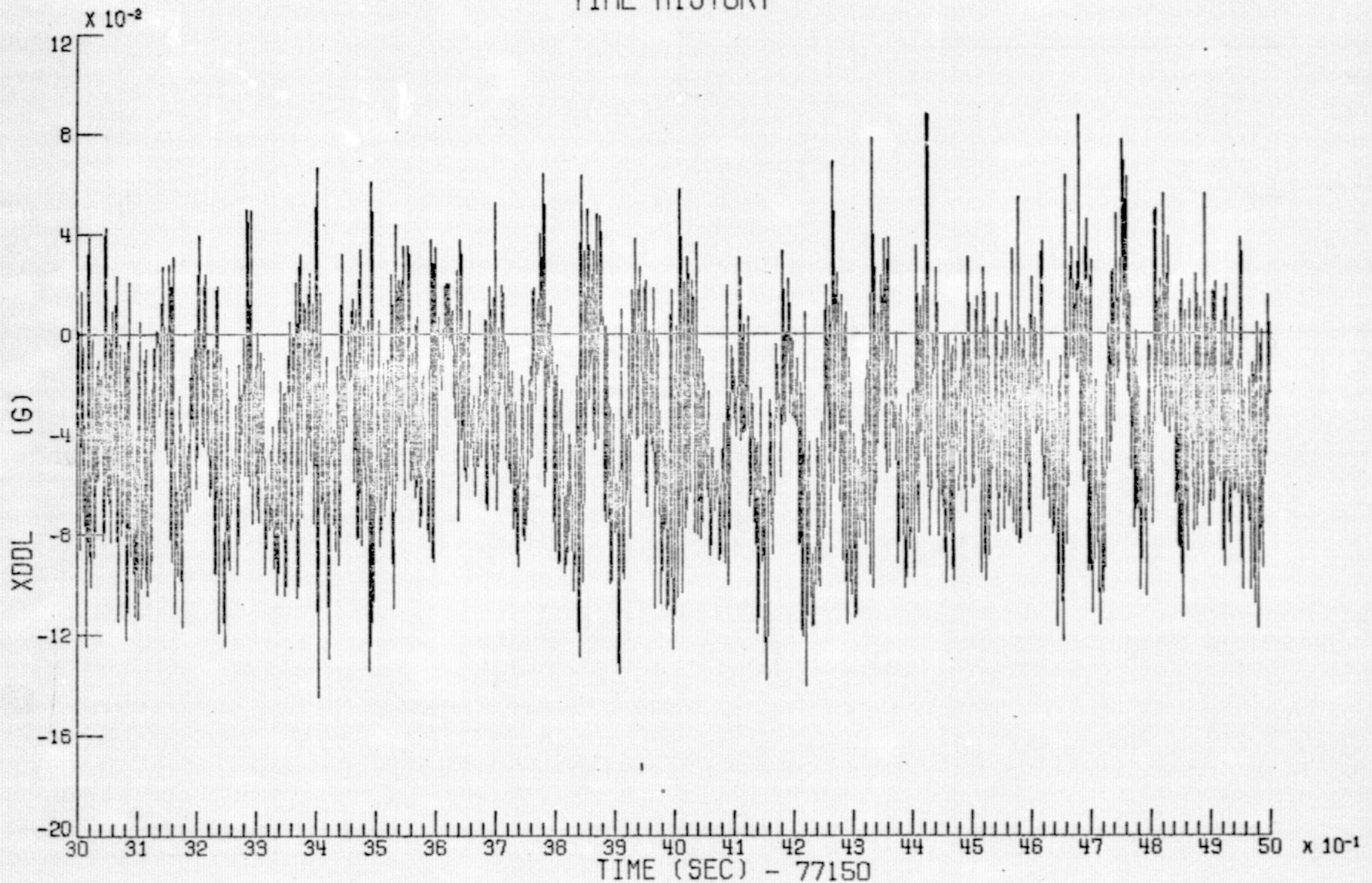
$3\sigma = 31 \times 10^{-2}$

VIKING A FLT (CIF)

POGO

CY1850

TIME HISTORY



MAX = .087

MIN = -.144

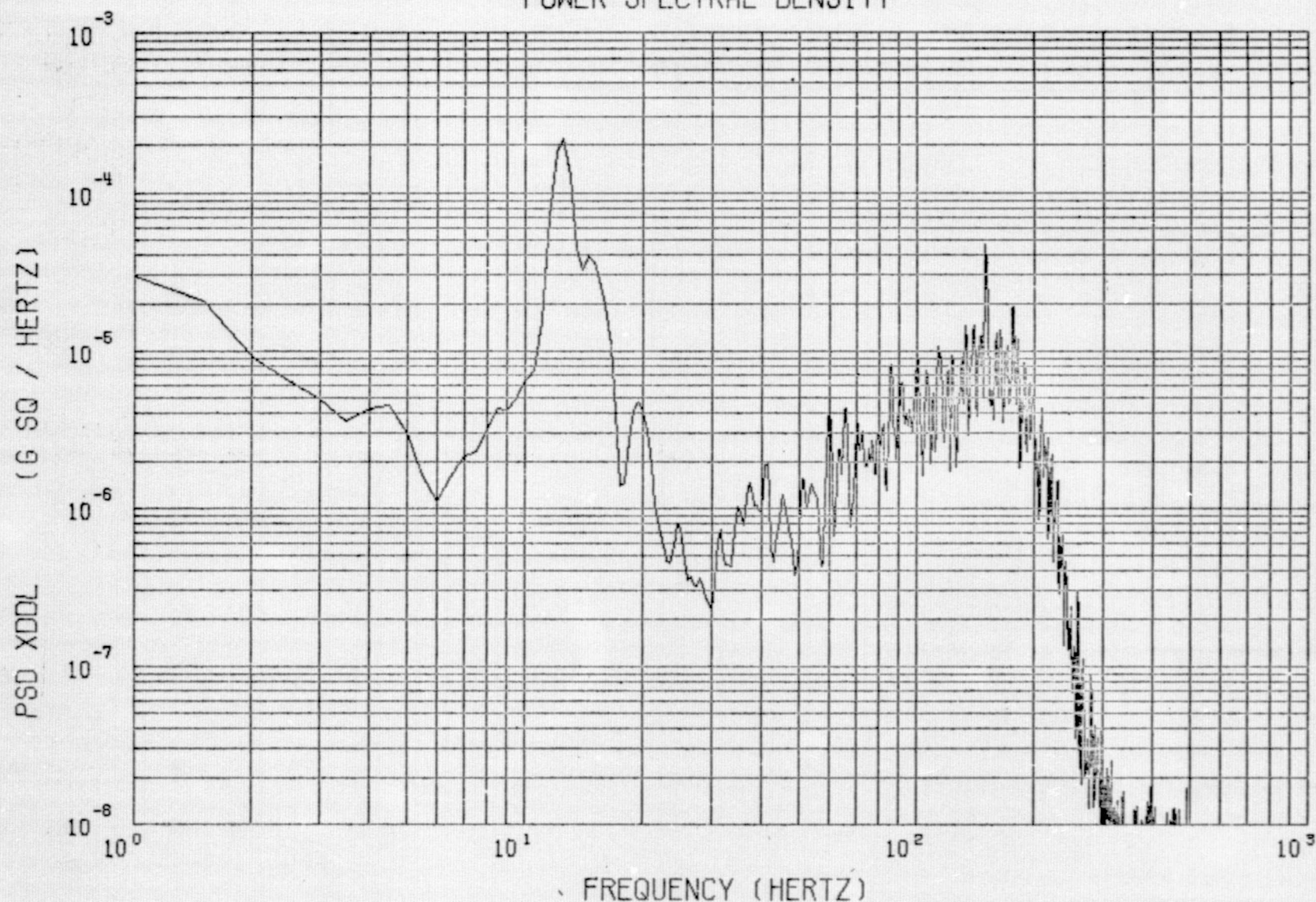
→ ±.16

VIKING A FLT (CIF)

POGO

XDDL

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77153.000 SEC

STOP = 77155.000 SEC

MEAN = -35103×10^{-6}

$\sigma^2 = 14703 \times 10^{-7}$

$\sigma = 38344 \times 10^{-6}$

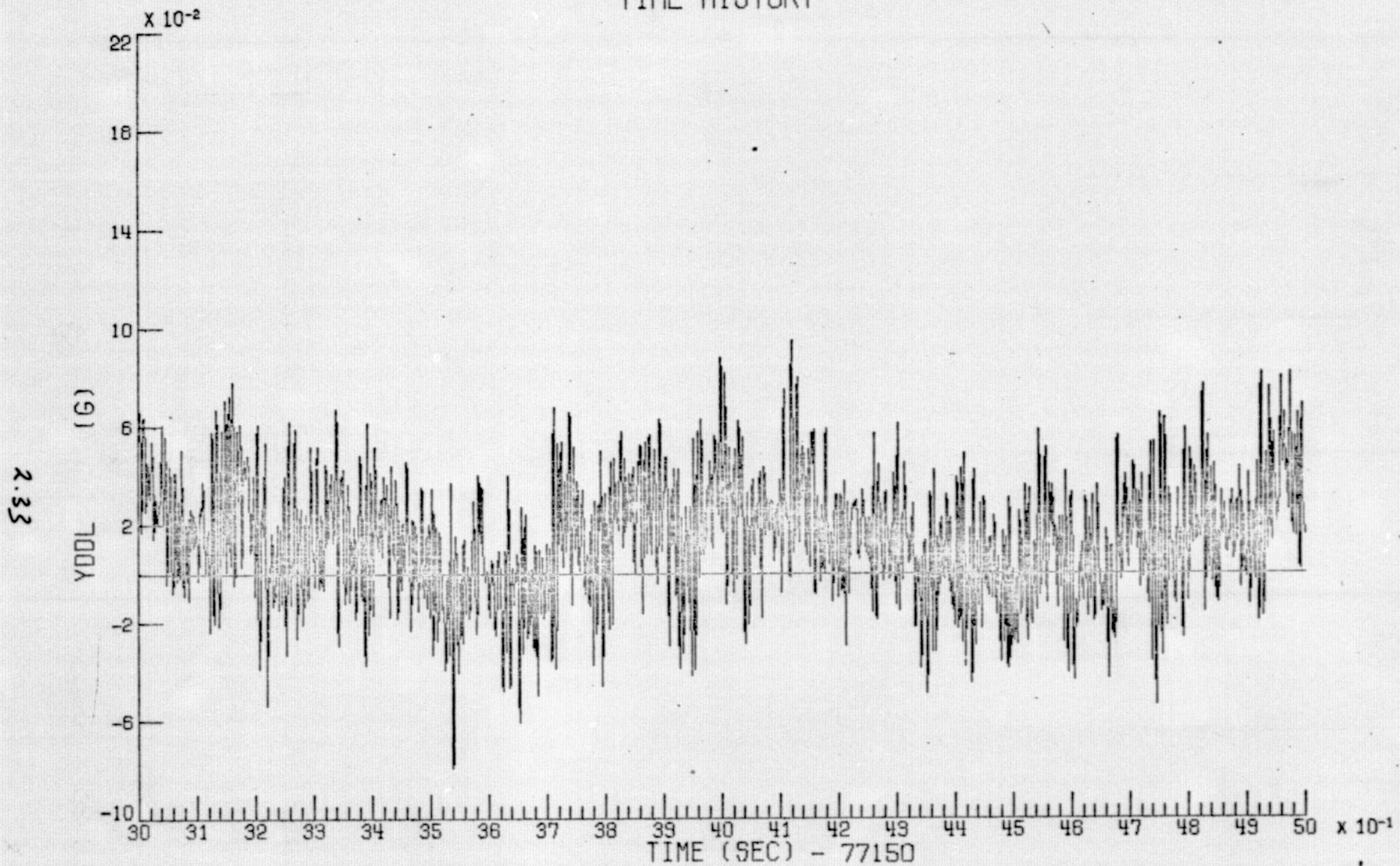
$3\sigma = 11503 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

XDDL

TIME HISTORY



MAX = .094

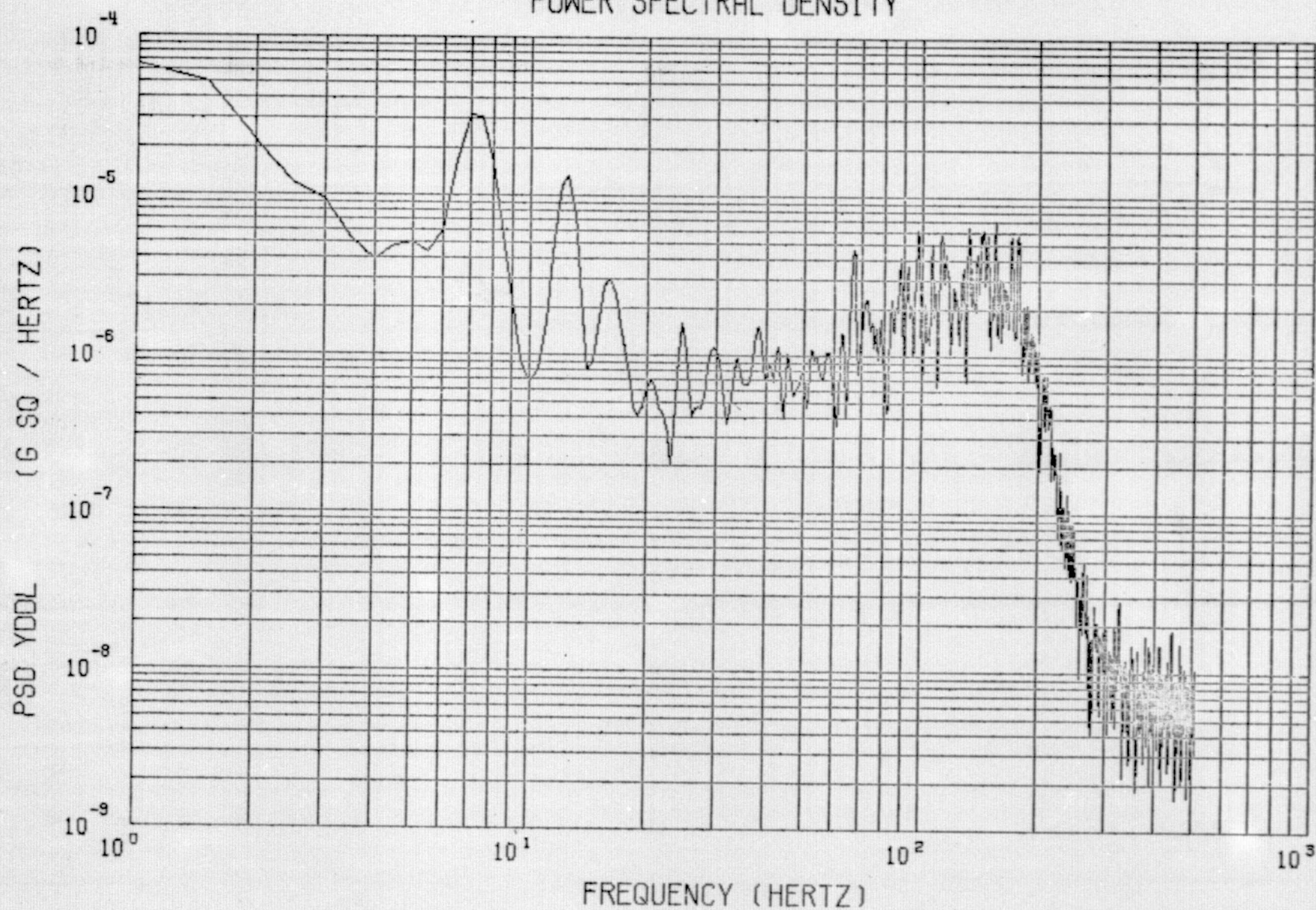
MIN = -.078 → ± .086

VIKING A FLT (CIF)

POGO

YDDL

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77153.000 SEC

STOP = 77155.000 SEC

MEAN = 13685×10^{-6}

$\sigma^2 = 57867 \times 10^{-6}$

$\sigma = 24055 \times 10^{-6}$

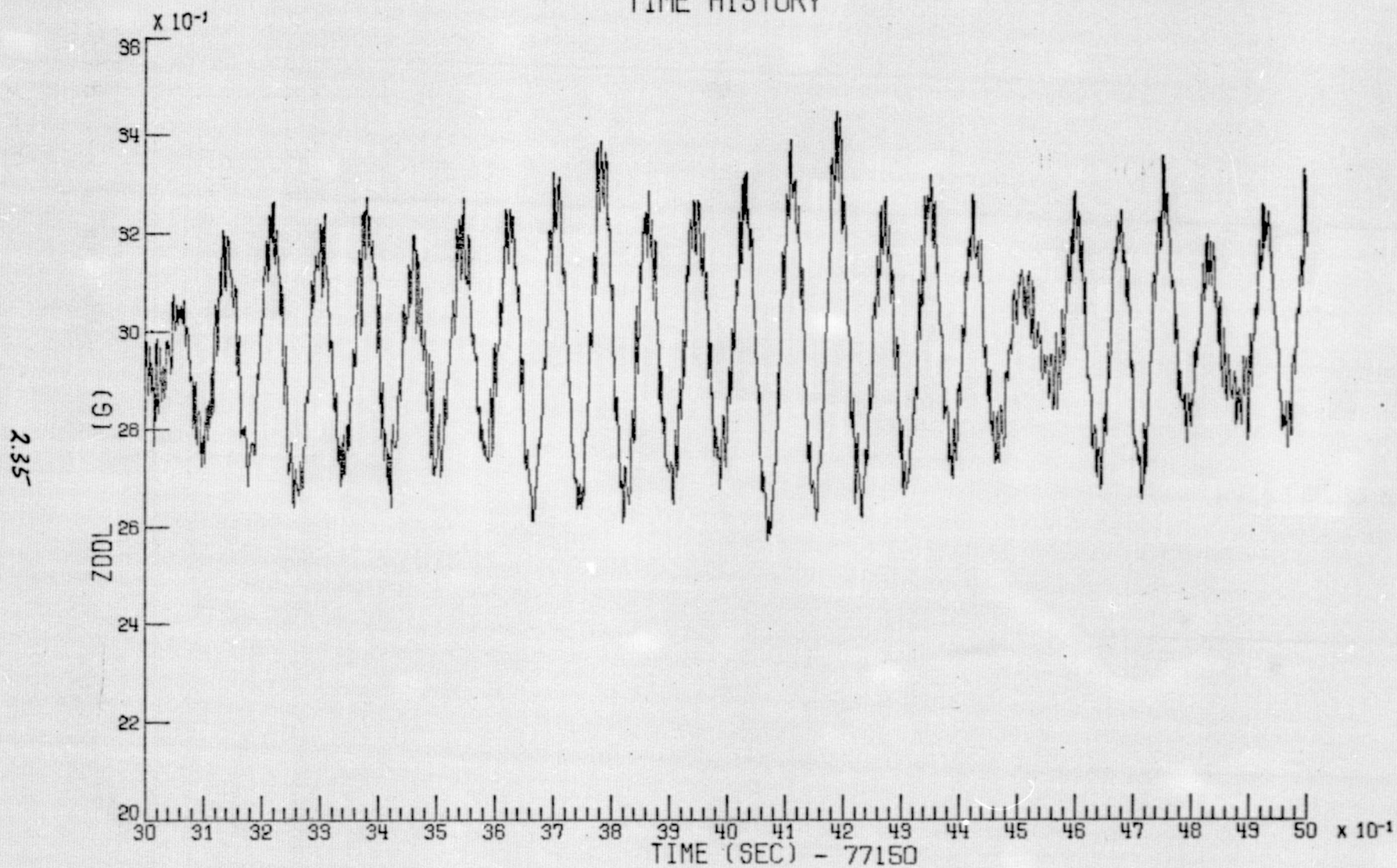
$3\sigma = 72166 \times 10^{-6}$

VIKING A FLT (CIF)

POGO

YDDL

TIME HISTORY



MAX = 3.445

MIN = 2.572

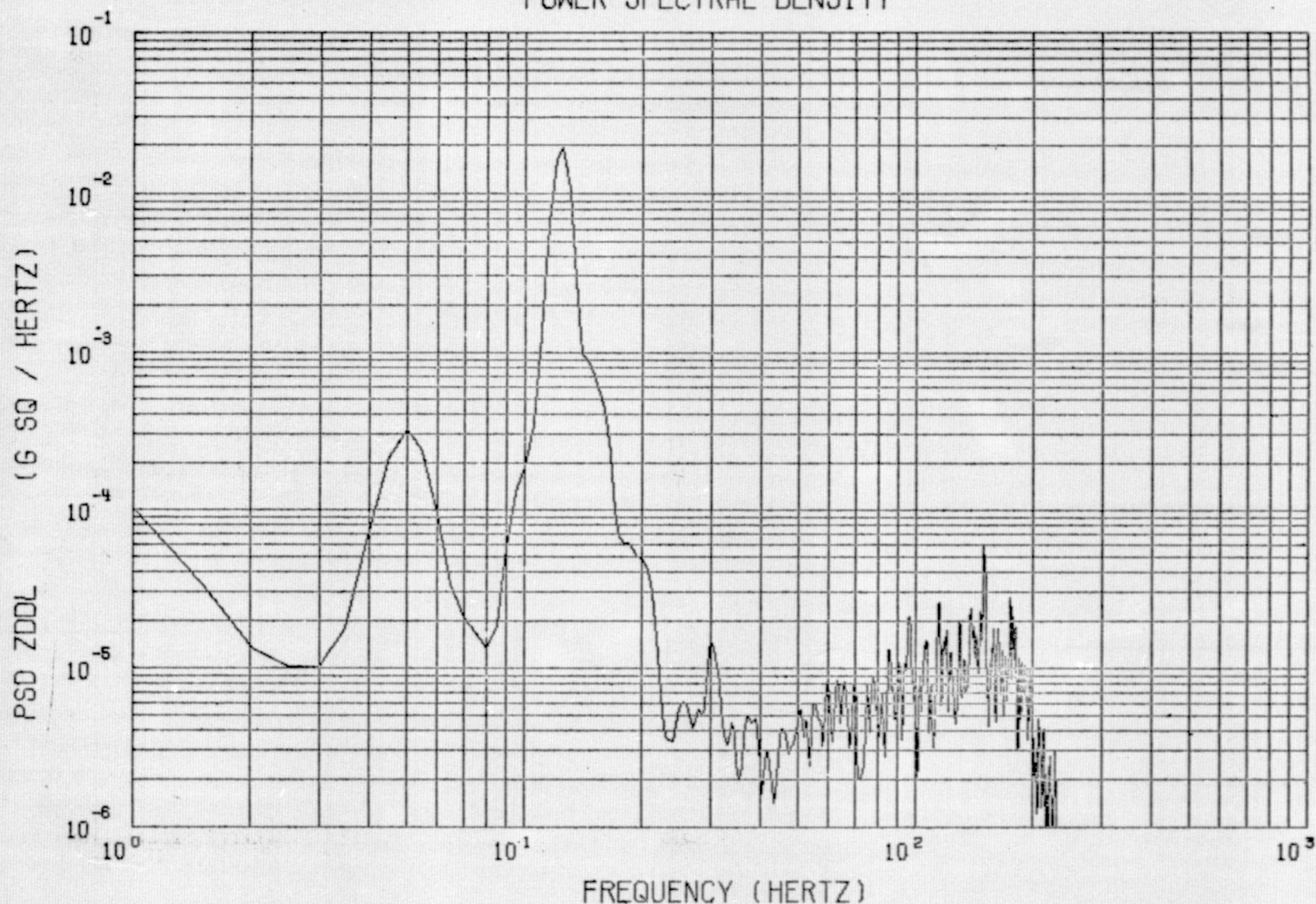
VIKING A FLT (CIF)

POGO

ZDDL

POWER SPECTRAL DENSITY

2.36



$\Delta F = .500$

START = 77153.000 SEC

STOP = 77155.000 SEC

MEAN = 29681×10^{-4}

$\sigma^2 = 33452 \times 10^{-6}$

$\sigma = 1829 \times 10^{-4}$

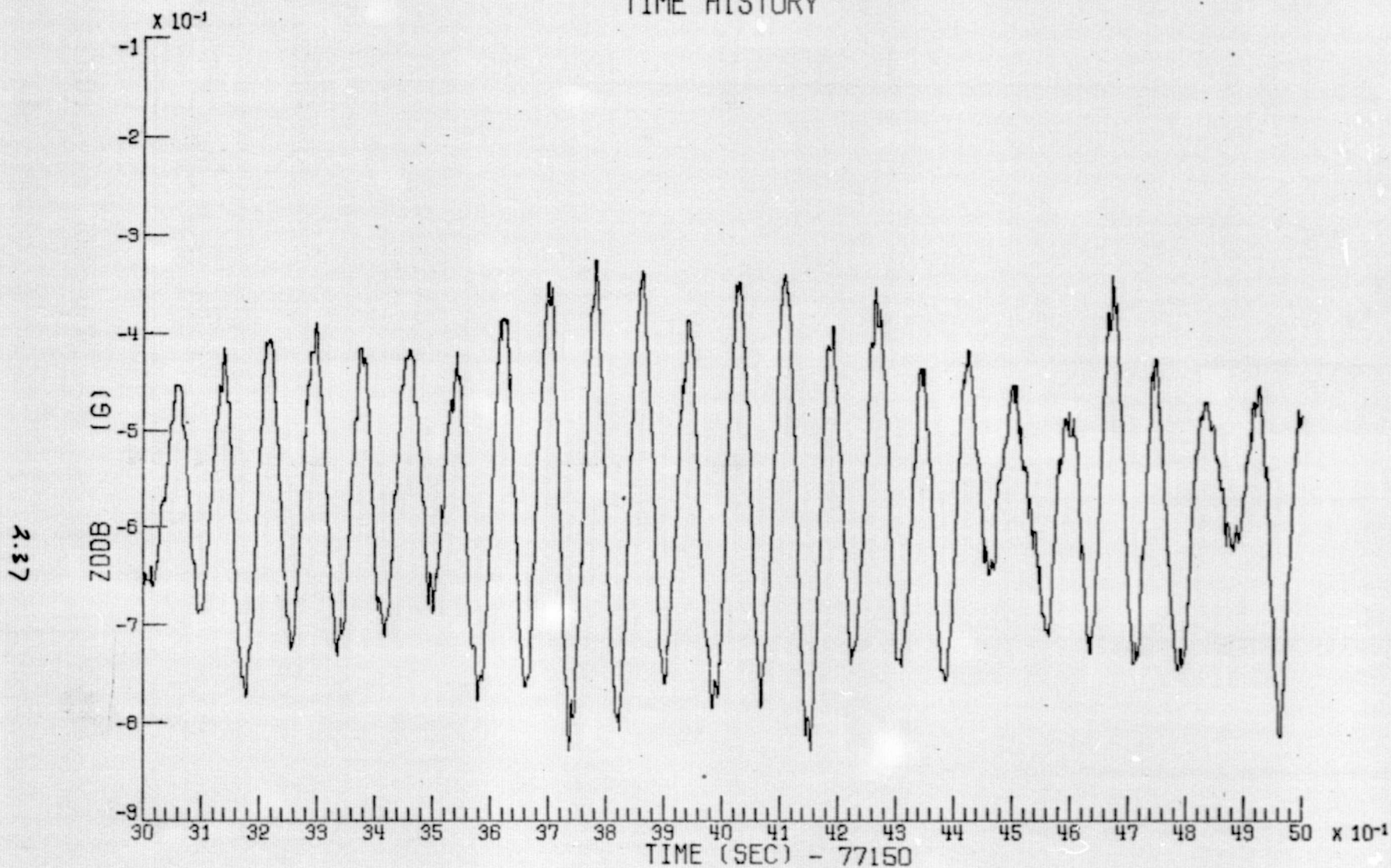
$3\sigma = 5487 \times 10^{-4}$

VIKING A FLT (CIF)

POGO

ZDDL

TIME HISTORY



MAX = -.325

MIN = -.826

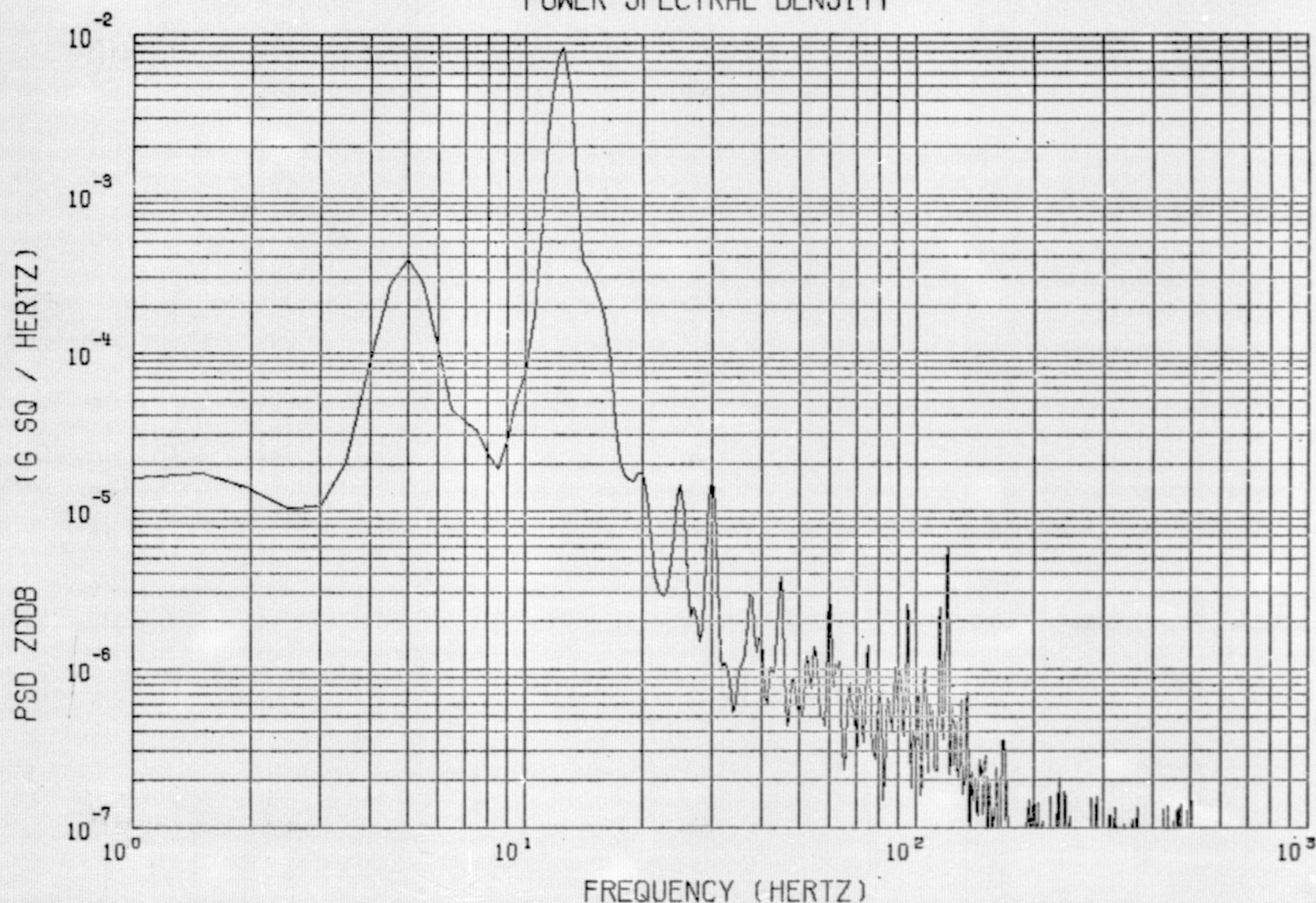
→ .25

VIKING A FLT (CIF)

POGO

ZODB

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77153.000 SEC

STOP = 77155.000 SEC

MEAN = -57456×10^{-5}

$\sigma^2 = 14309 \times 10^{-5}$

$\sigma = 11962 \times 10^{-5}$

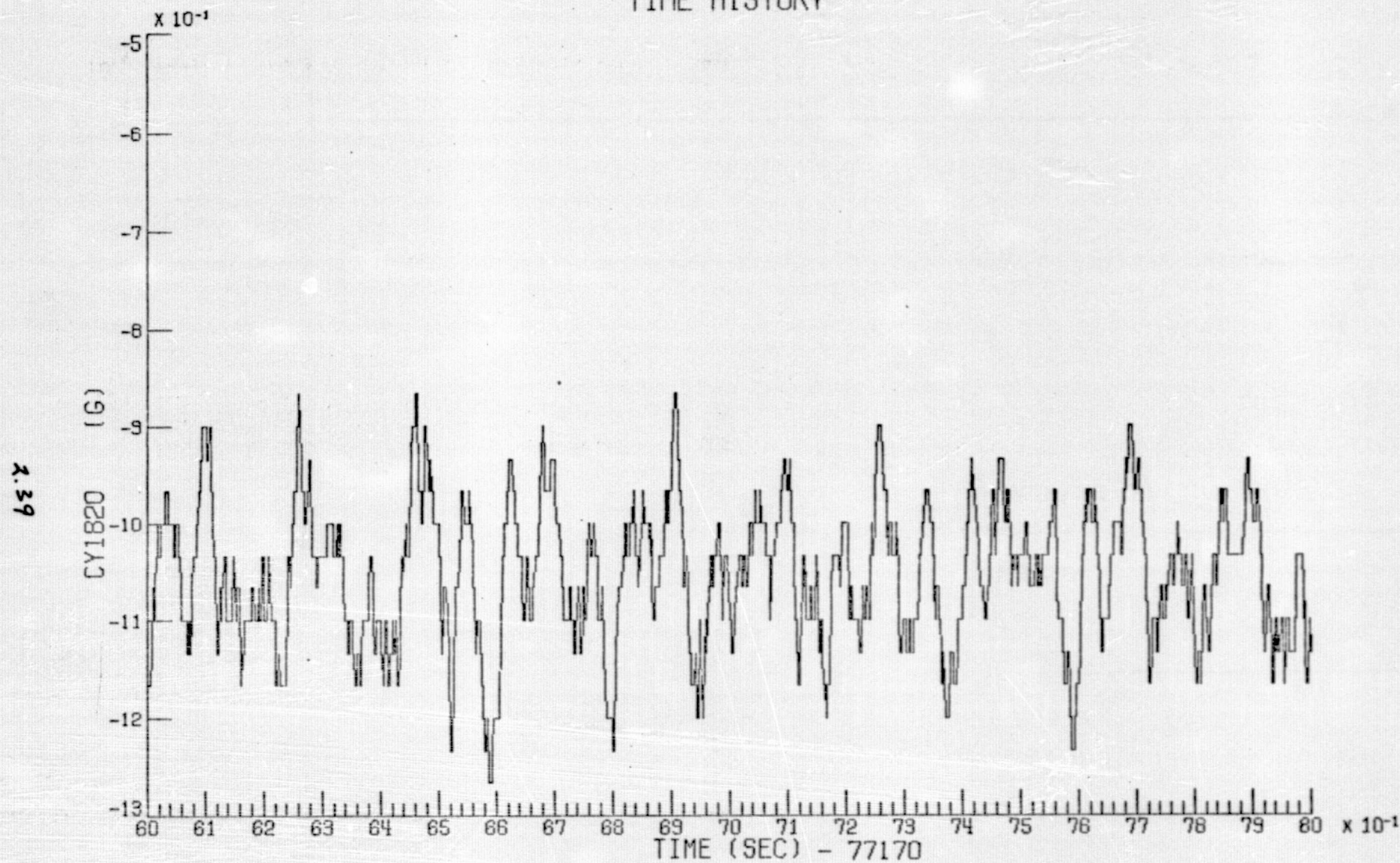
$3\sigma = 35886 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

ZODB

TIME HISTORY



VIKING A FLT (CIF)

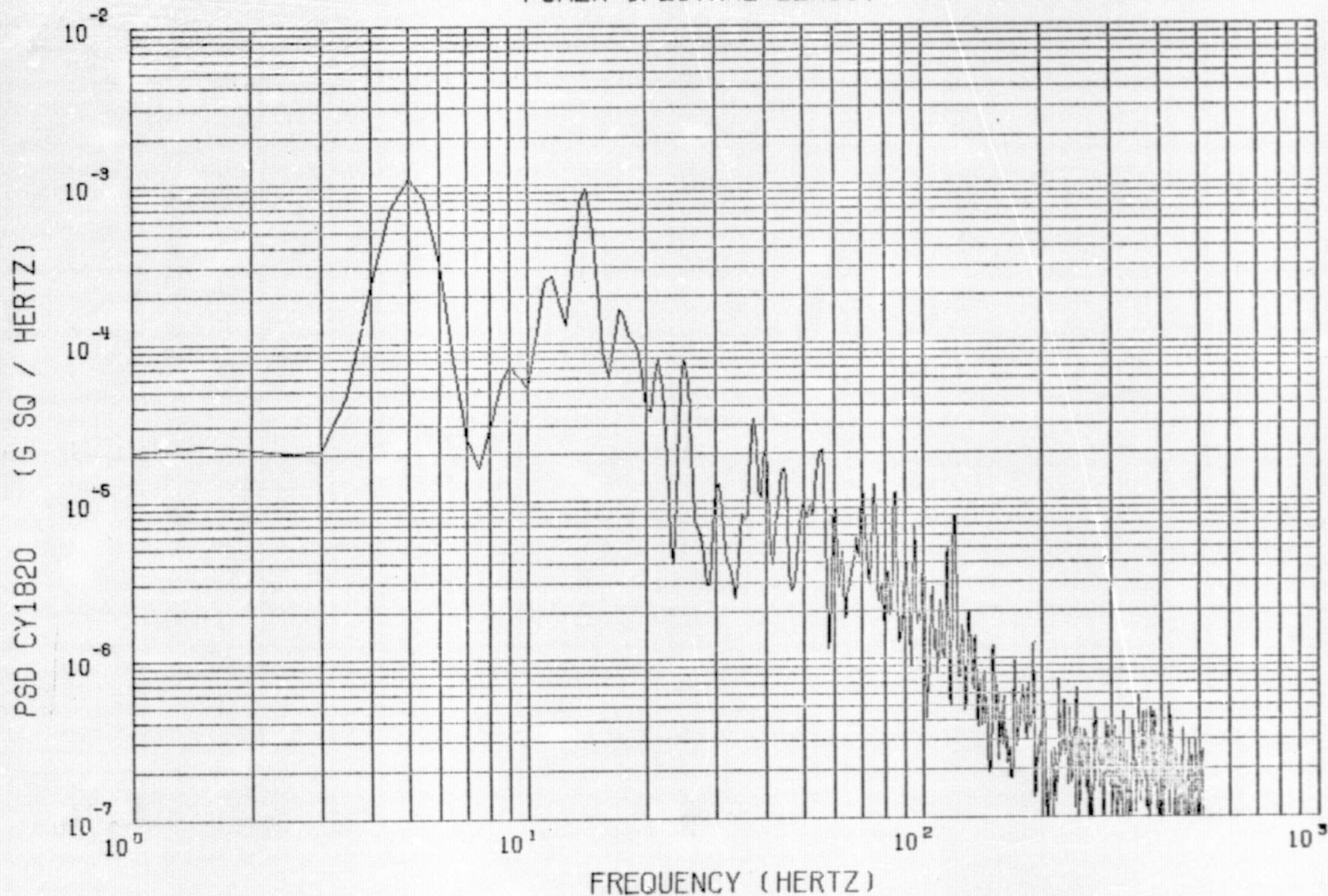
POGO

CY1820

NASA-LANGLEY SIGNAL ANALYSIS PROGRAM 08/21/75

FIGURE 2.18 a

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77176.000 SEC

STOP = 77178.000 SEC

MEAN = -1064×10^{-3}

$\sigma^2 = 51266 \times 10^{-7}$

$\sigma = 716 \times 10^{-4}$

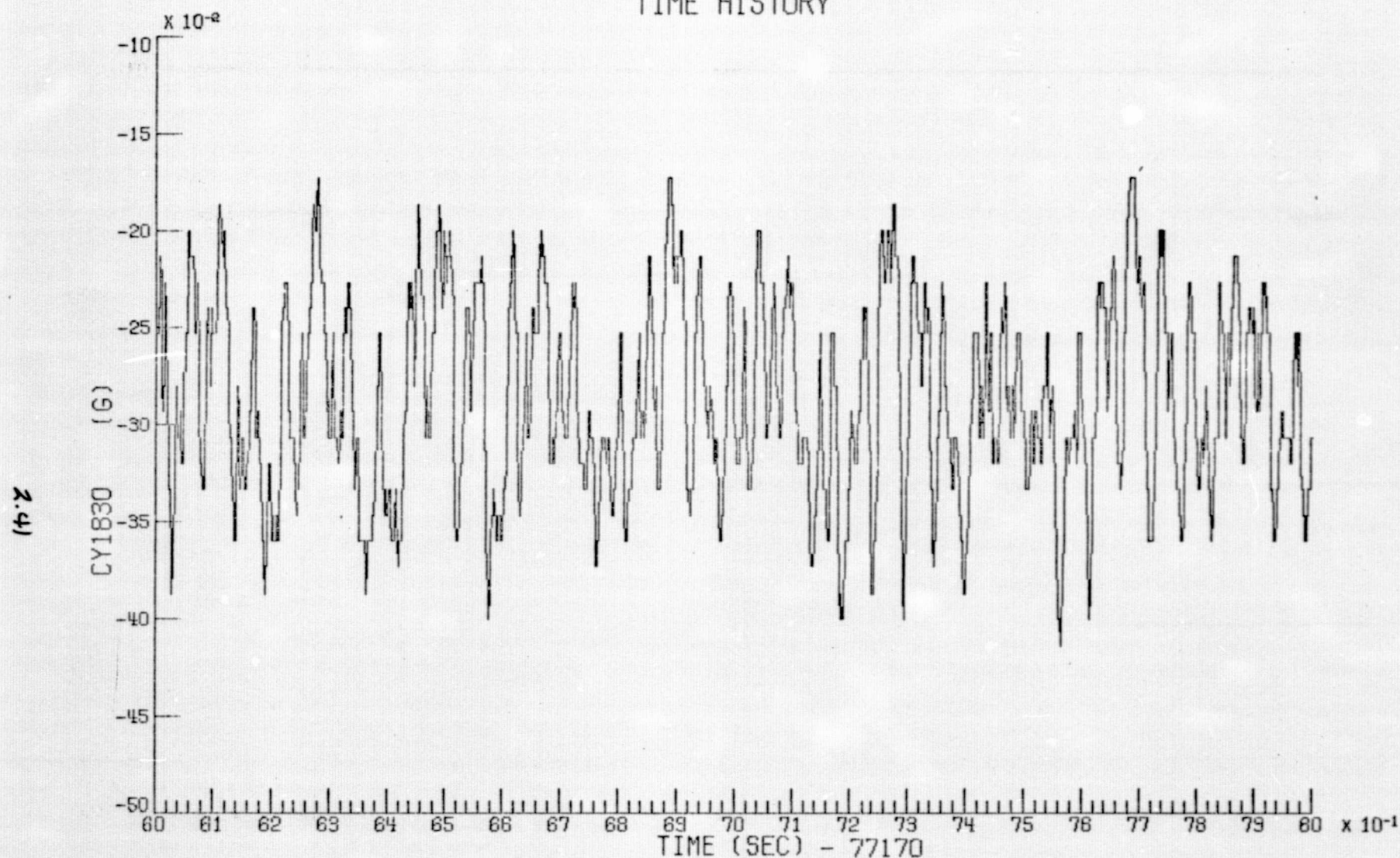
$3\sigma = 2148 \times 10^{-4}$

VIKING A FLT (CIF)

POGO

CY1820

TIME HISTORY



MAX = -.173

MIN = -.413

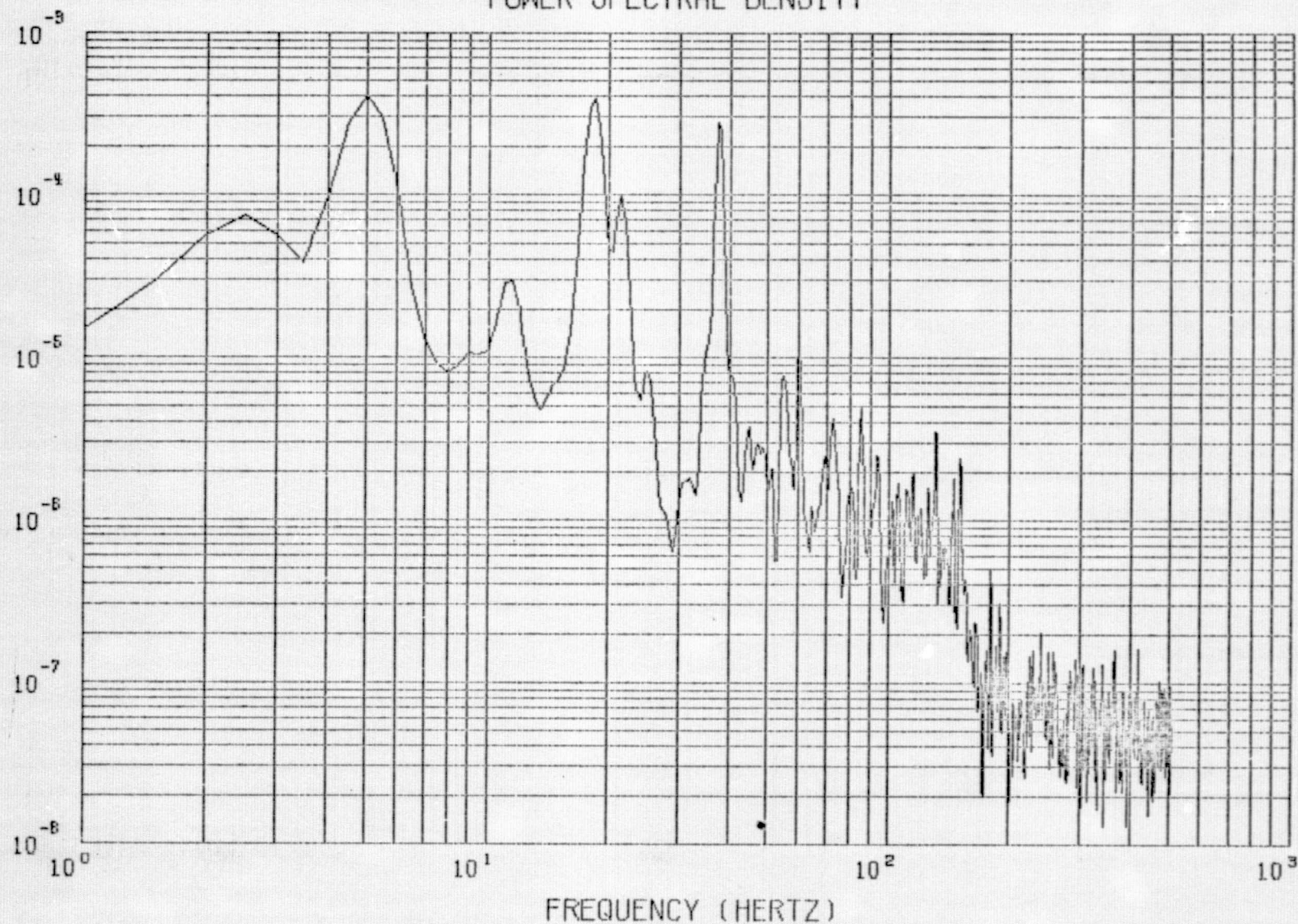
VIKING A FLT (CIF)

POGO

CY1830

POWER SPECTRAL DENSITY

2.42
PSD CY1830 (G SQ / HERTZ)



$\Delta F = .500$

START = 77176.000 SEC

STOP = 77178.000 SEC

MEAN = -28684×10^{-5}

$\sigma^2 = 24761 \times 10^{-7}$

$\sigma = 4976 \times 10^{-5}$

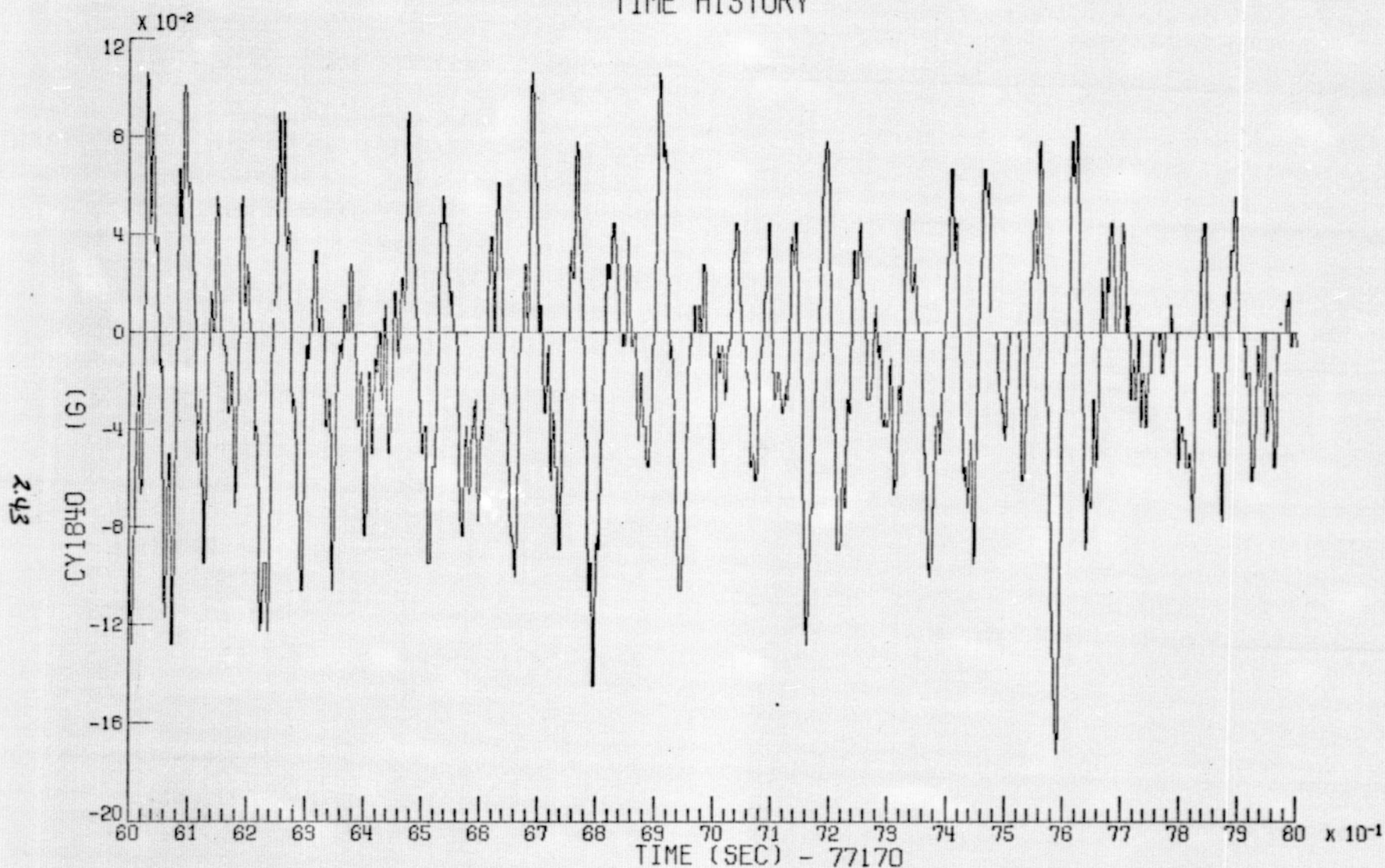
$3\sigma = 14928 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

CY1830

TIME HISTORY



MAX = .105

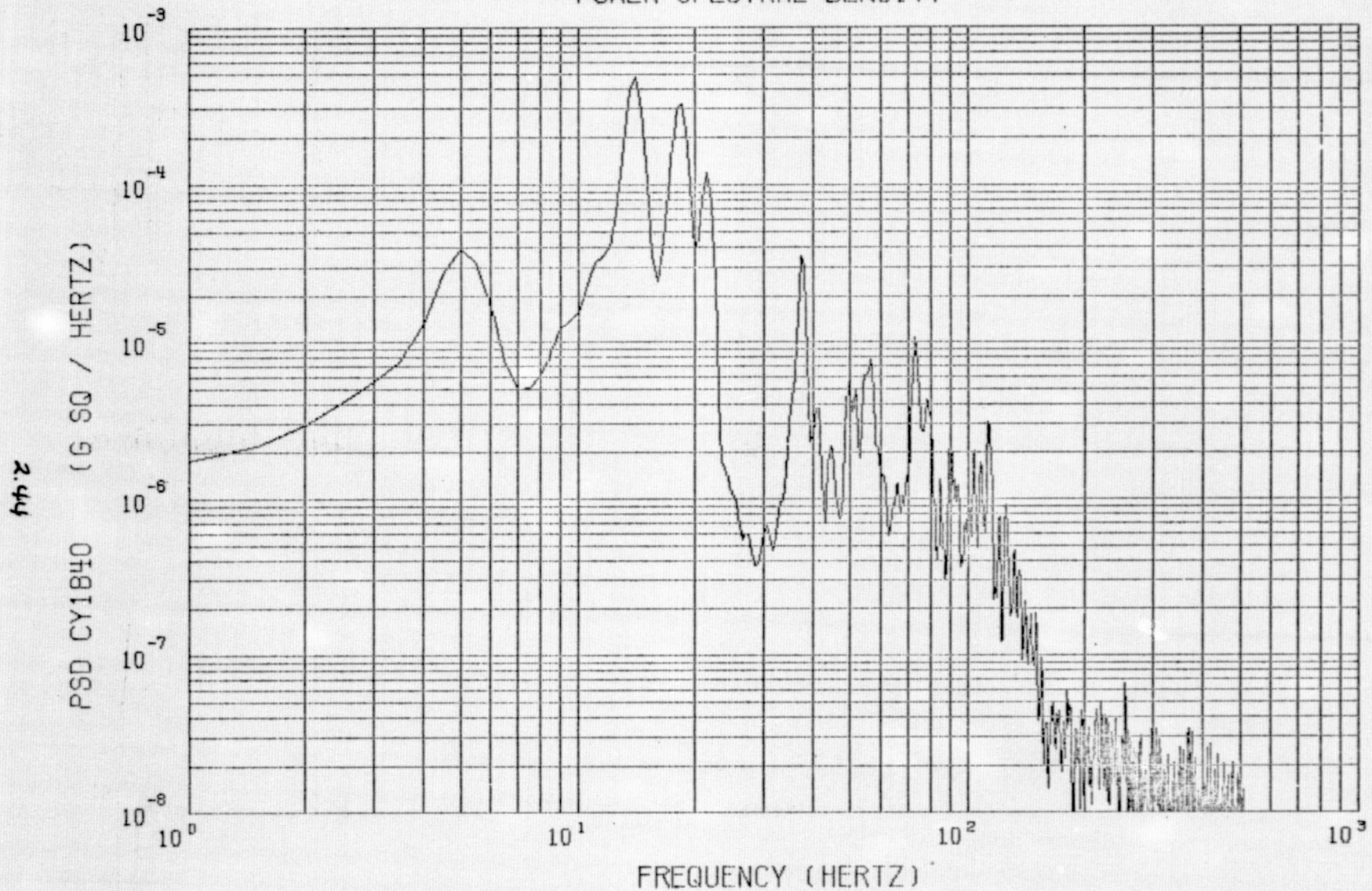
MIN = -.172

VIKING A FLT (CIF)

POGO

CY1840

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77176.000 SEC

STOP = 77178.000 SEC

MEAN = -12852×10^{-6}

$\sigma^2 = 20509 \times 10^{-7}$

$\sigma = 45287 \times 10^{-6}$

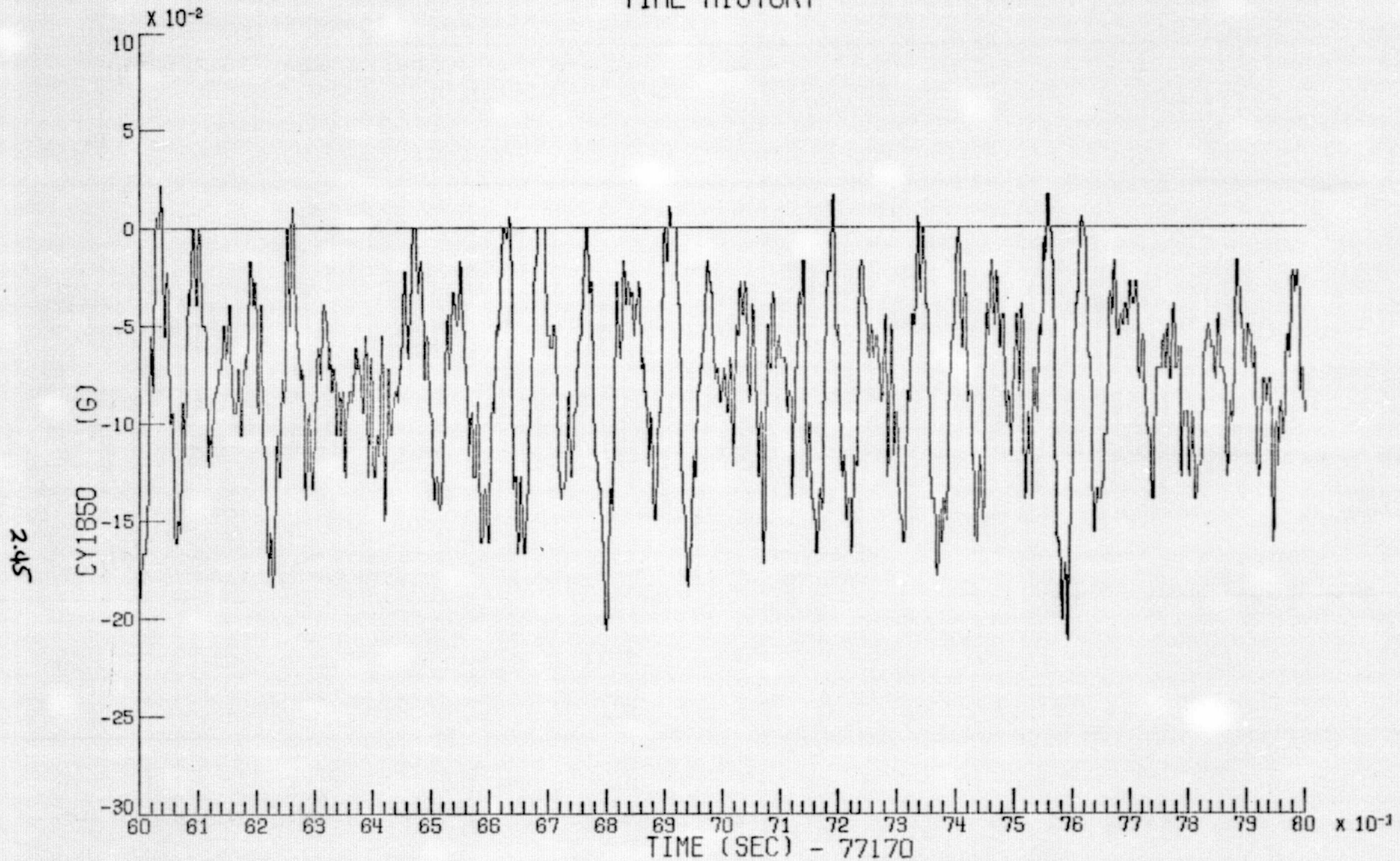
$3\sigma = 13586 \times 10^{-6}$

VIKING A FLT (CIF)

POGO

CY1840

TIME HISTORY



VIKING A FLT (CIF)

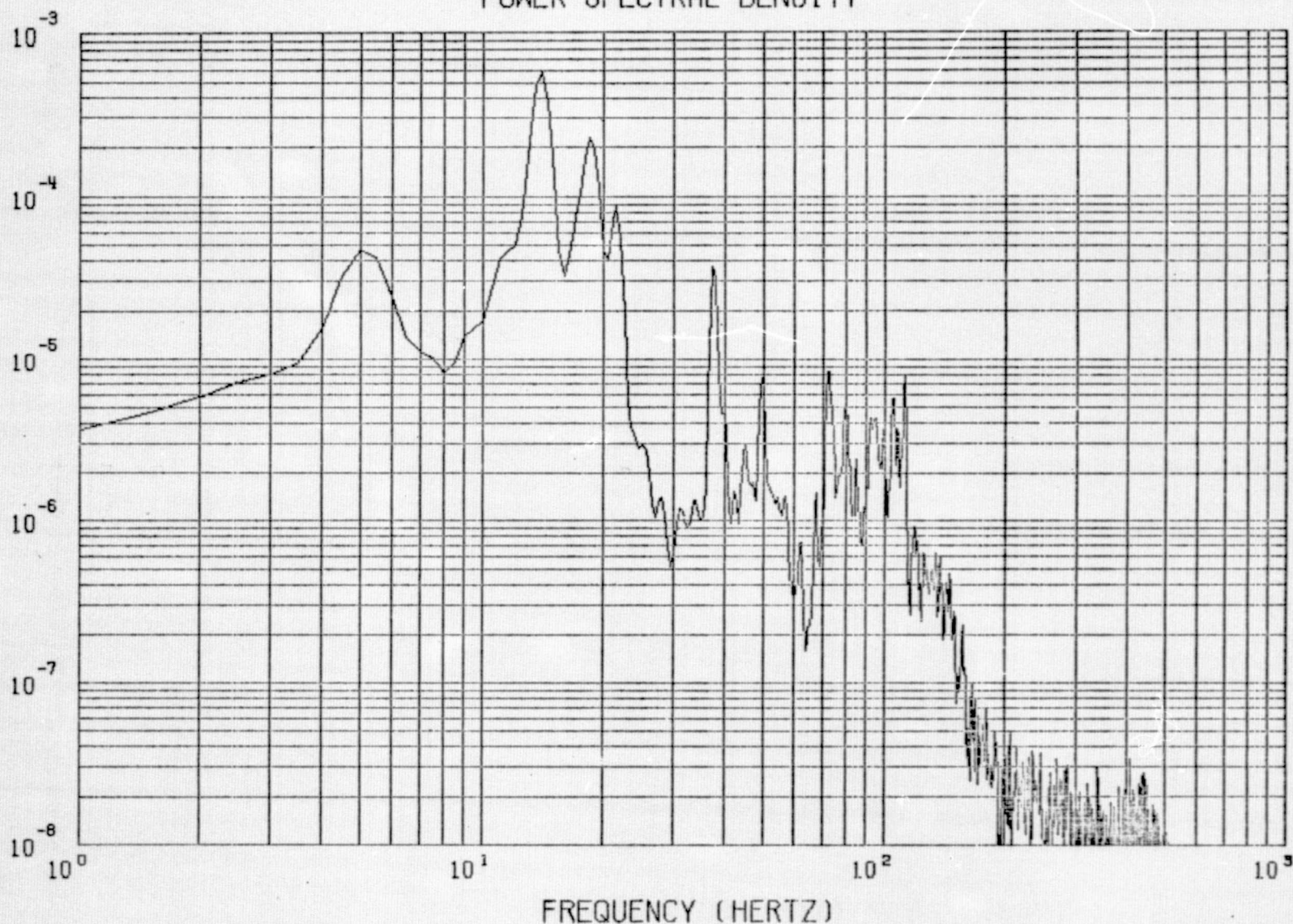
POGO

CY1850

2.46

PSD CY1850 (G SQ / HERTZ)

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77176.000 SEC

STOP = 77178.000 SEC

MEAN = -79317×10^{-6}

$\sigma^2 = 21136 \times 10^{-7}$

$\sigma = 45974 \times 10^{-6}$

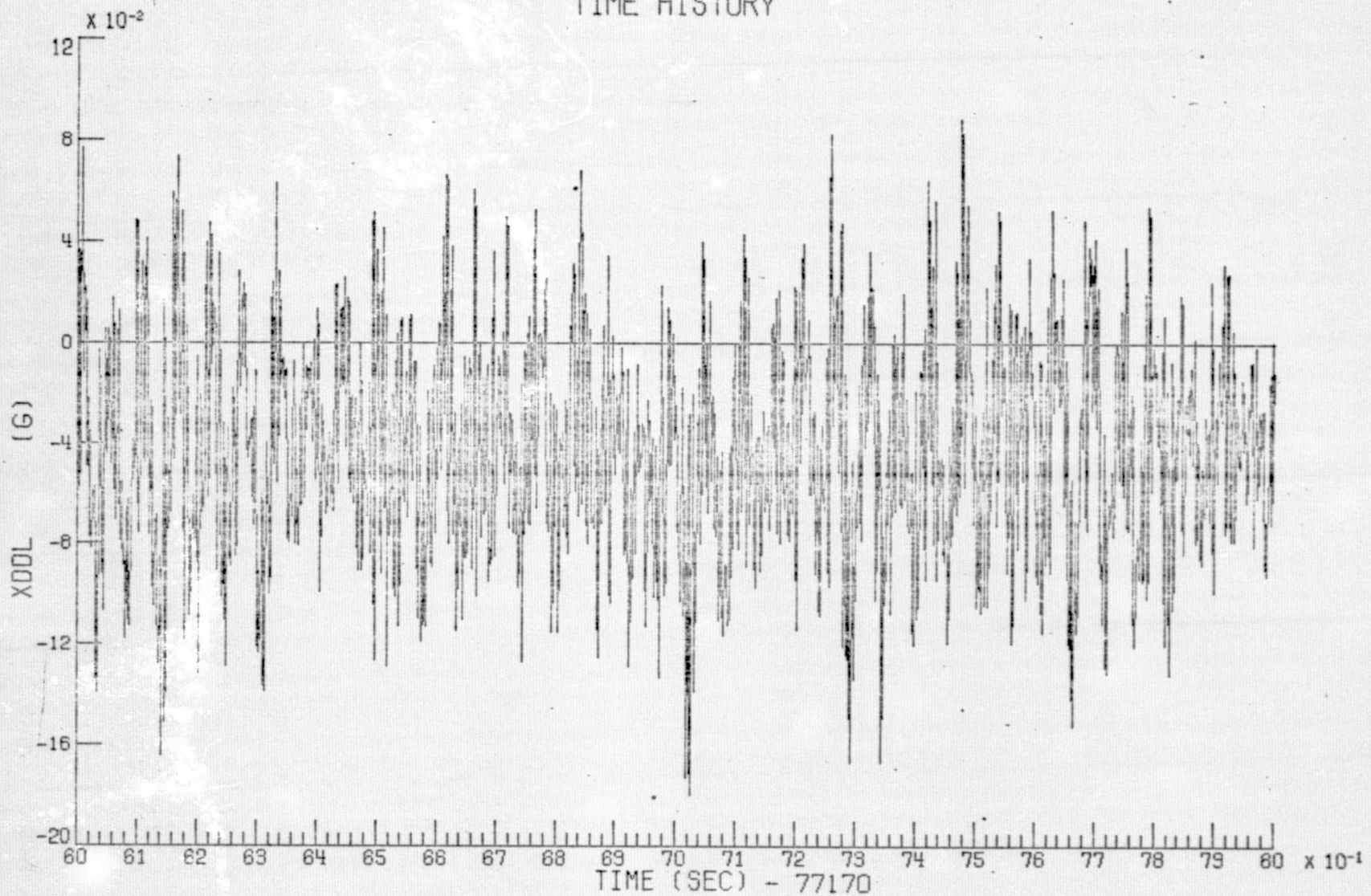
$3\sigma = 13792 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

CY1850

TIME HISTORY



MAX = .088

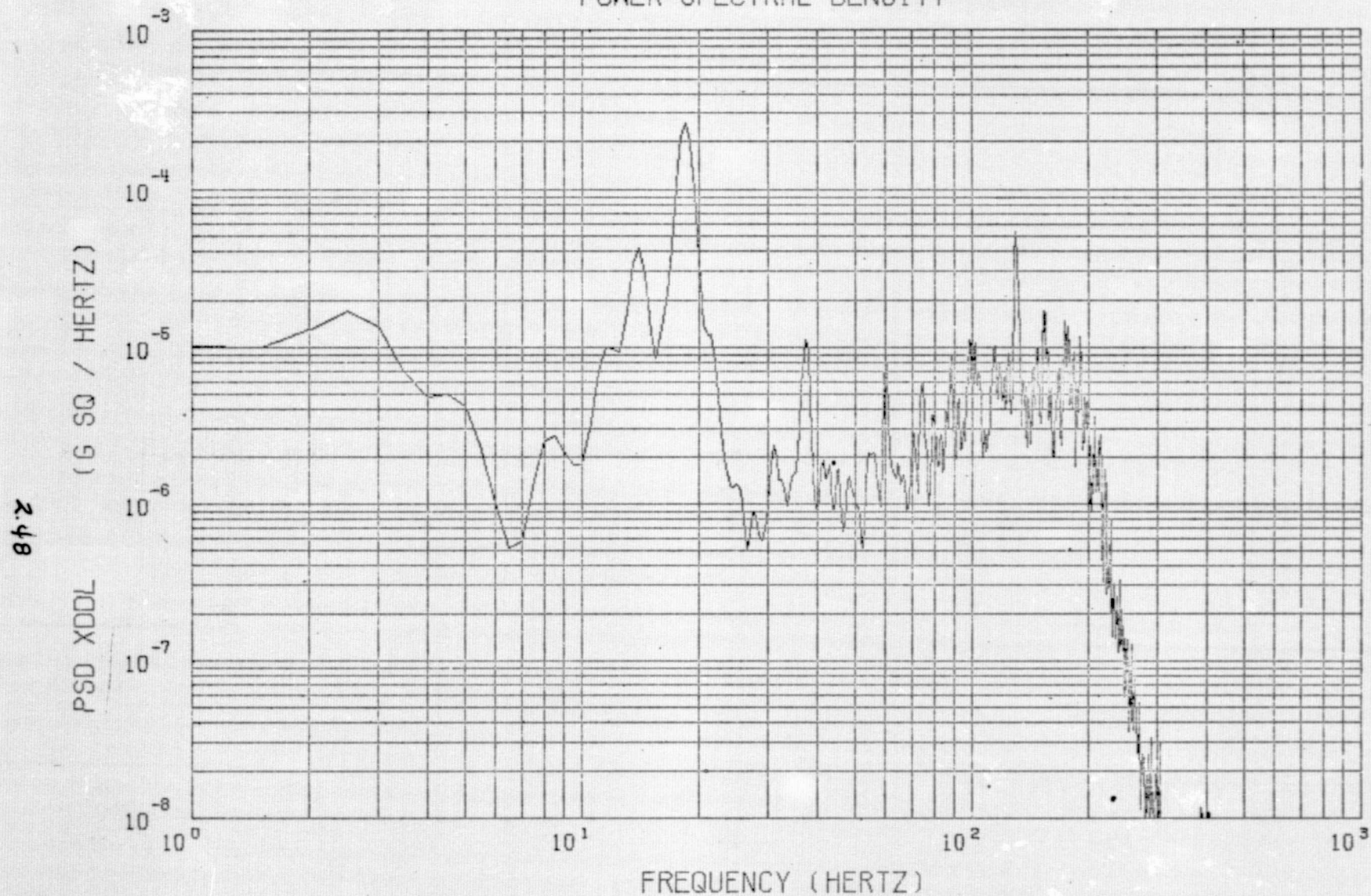
MIN = -.179

VIKING A FLT (CIF)

POGO

XDDL

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77176.000 SEC

STOP = 77178.000 SEC

MEAN = -41658×10^{-6}

$\sigma^2 = 16256 \times 10^{-7}$

$\sigma = 40319 \times 10^{-6}$

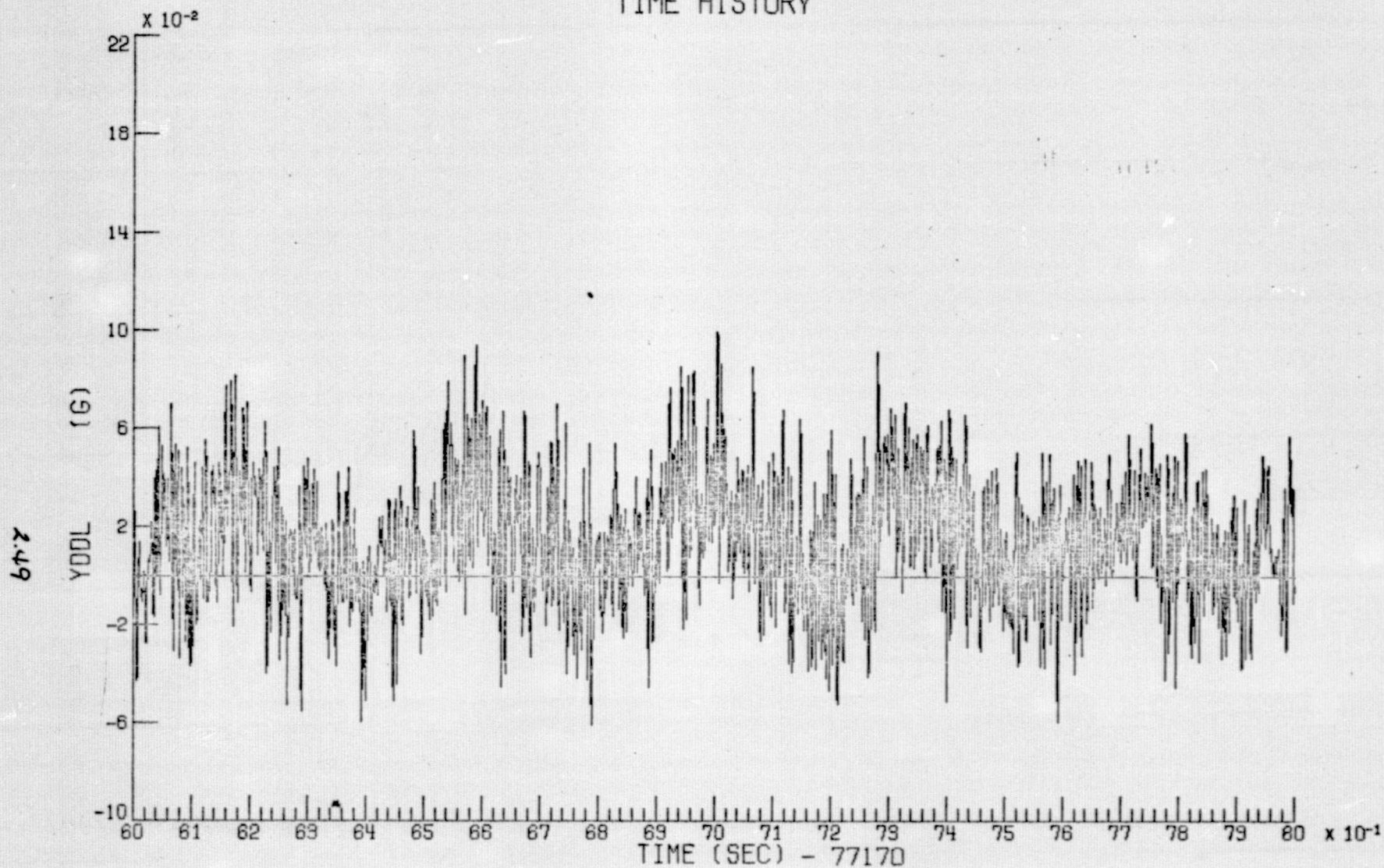
$3\sigma = 12095 \times 10^{-6}$

VIKING A FLT (CIF)

POGO

XDDL

TIME HISTORY



MAX = .099

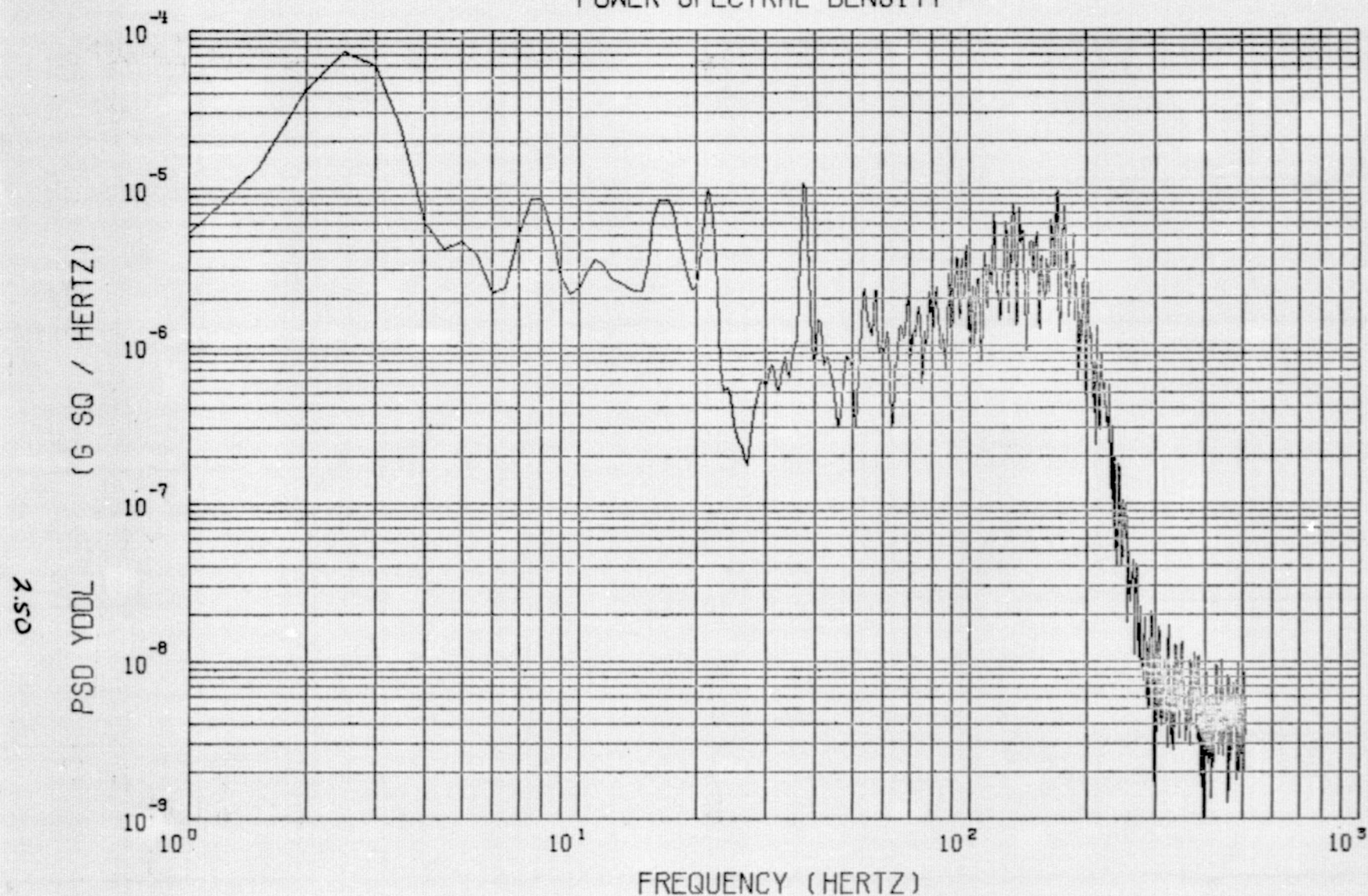
MIN = -.060

VIKING A FLT (CIF)

POGO

YDDL

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77176.000 SEC

STOP = 77178.000 SEC

MEAN = 13951×10^{-6}

$\sigma^2 = 65123 \times 10^{-6}$

$\sigma = 25519 \times 10^{-6}$

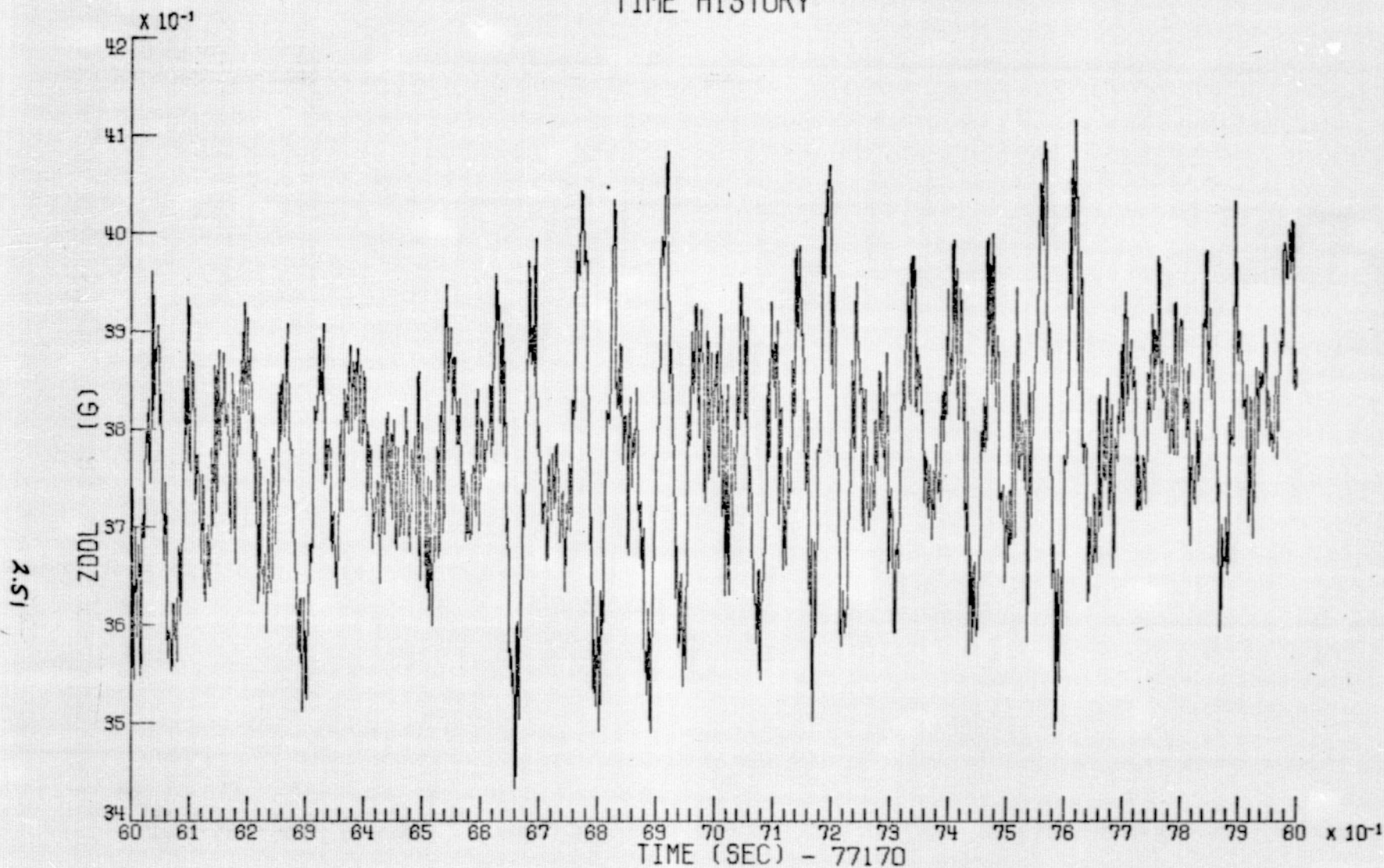
$3\sigma = 76557 \times 10^{-6}$

VIKING A FLT (CIF)

POGO

YDDL

TIME HISTORY



MAX = 4.113

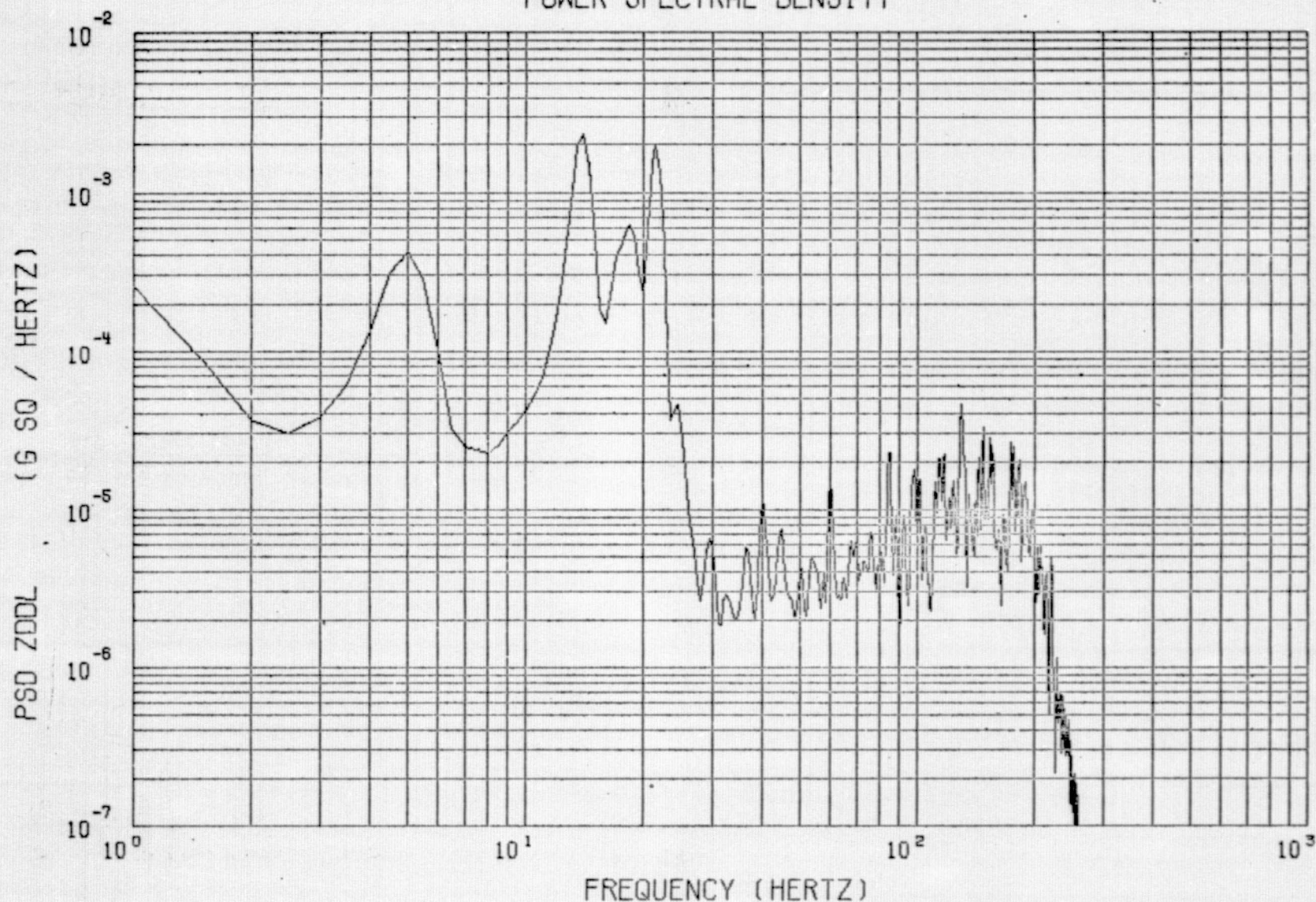
MIN = 3.433

VIKING A FLT (CIF)

POGO

ZDDL

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77176.000 SEC

STOP = 77178.000 SEC

MEAN = 37802×10^{-9}

$\sigma^2 = 11889 \times 10^{-5}$

$\sigma = 10903 \times 10^{-5}$

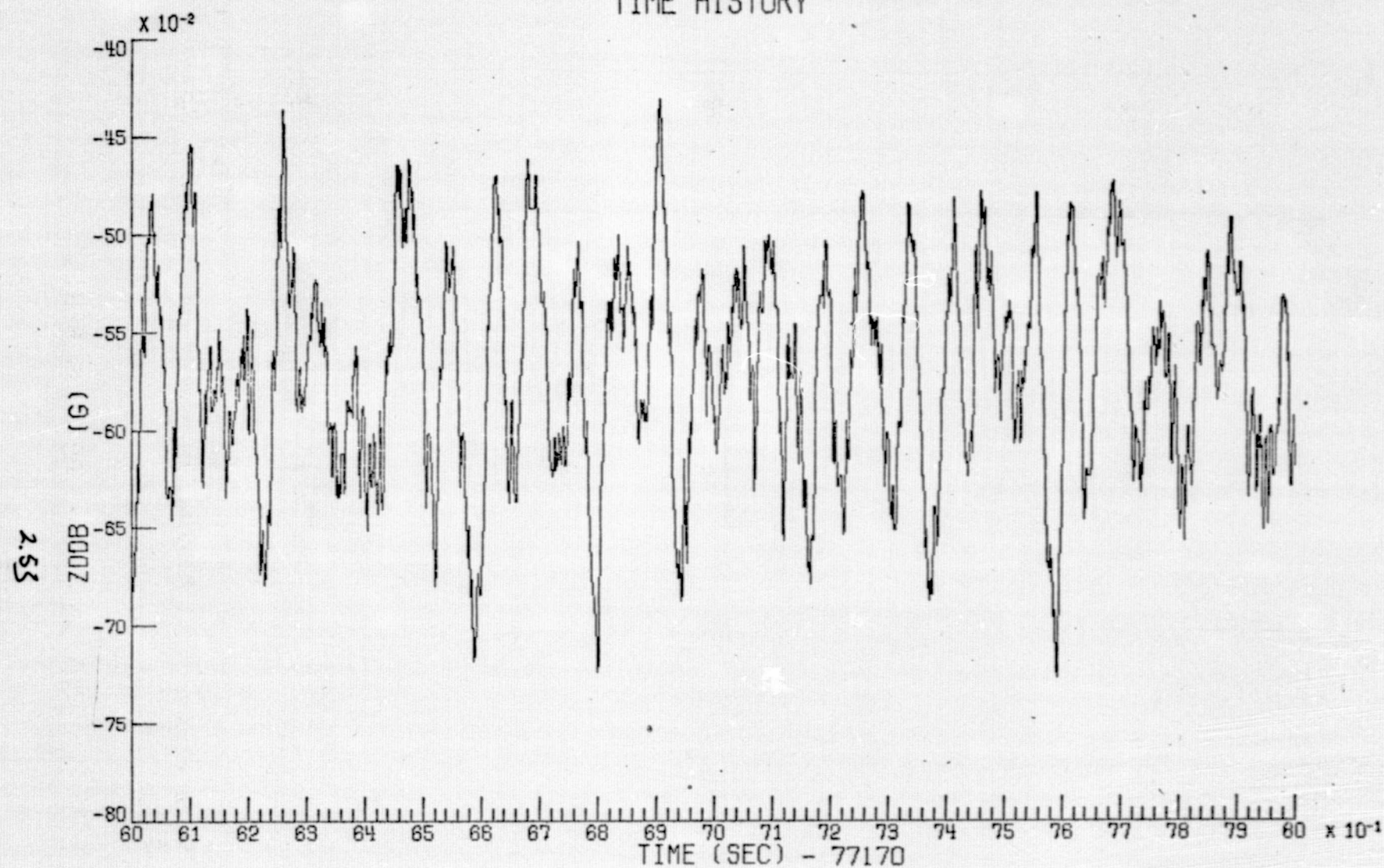
$3\sigma = 32711 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

ZDDL

TIME HISTORY



MAX = -.431

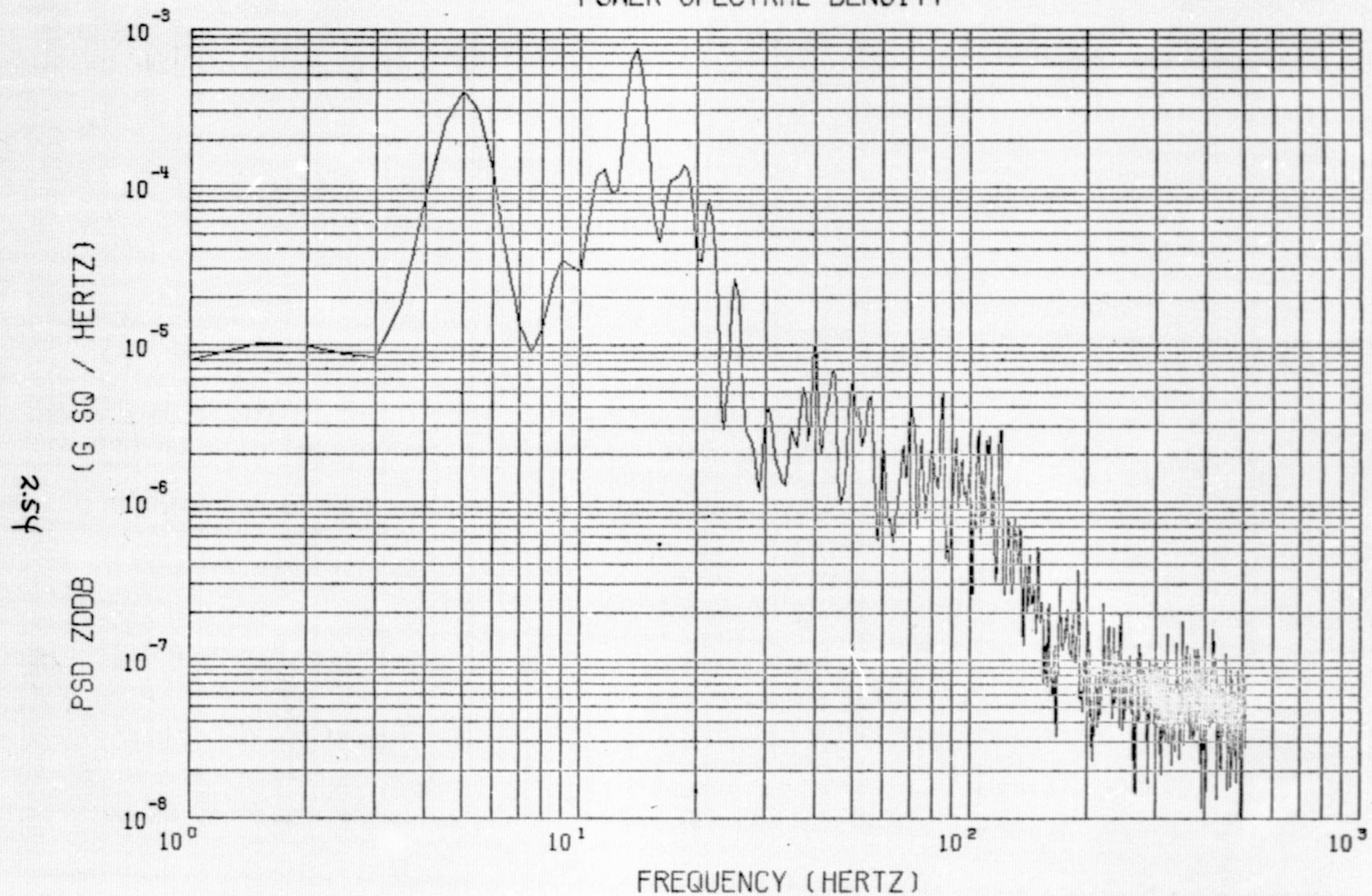
MIN = -.726

VIKING A FLT (CIF)

POGO

ZODB

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77176.000 SEC

STOP = 77178.000 SEC

MEAN = -57052×10^{-9}

$\sigma^2 = 29511 \times 10^{-7}$

$\sigma = 54324 \times 10^{-6}$

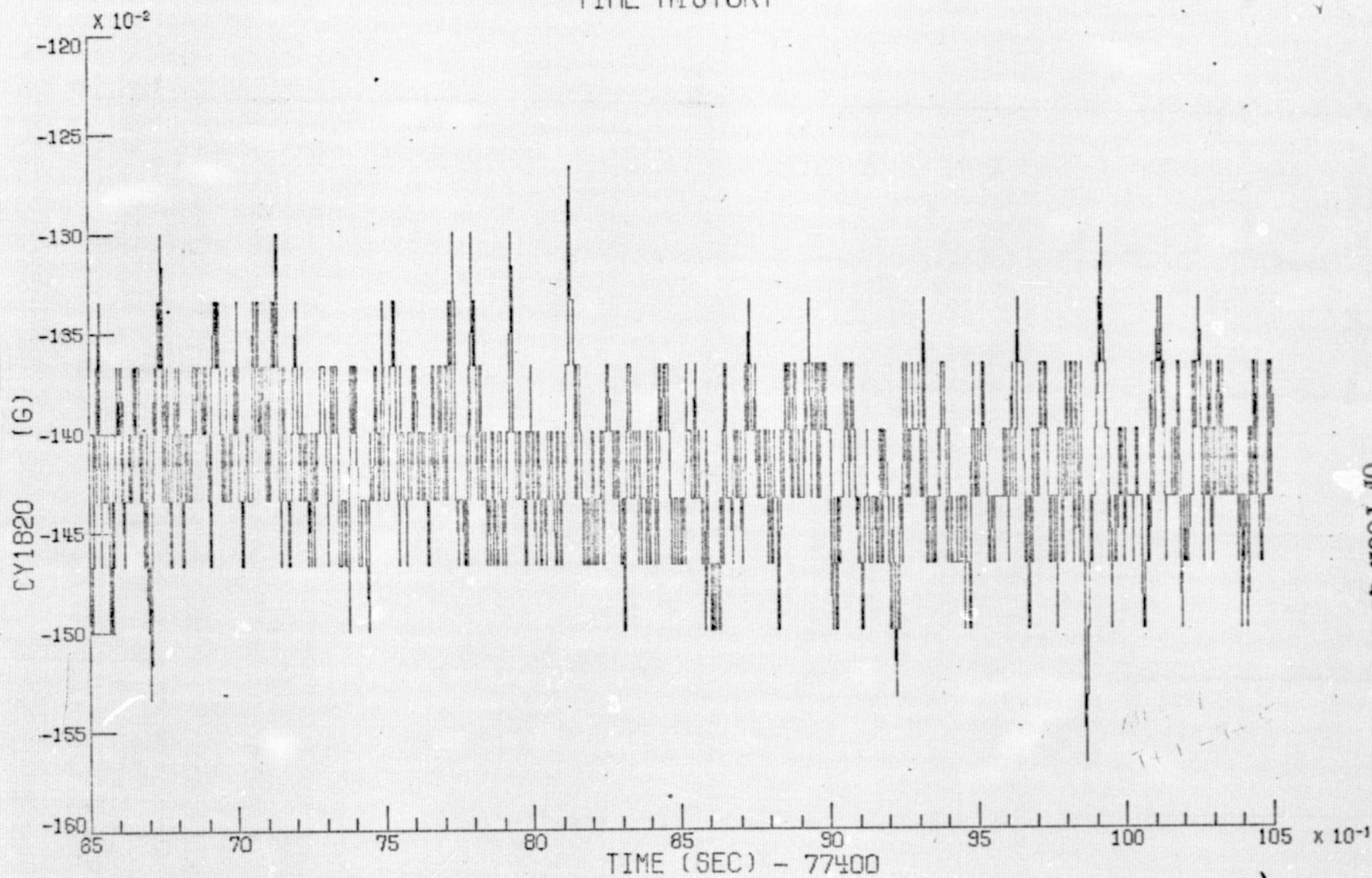
$3\sigma = 16297 \times 10^{-5}$

VIKING A FLT (CIF)

POGO

ZODB

TIME HISTORY



MAX = -1.266

MIN = -1.566 $\rightarrow \pm .150$

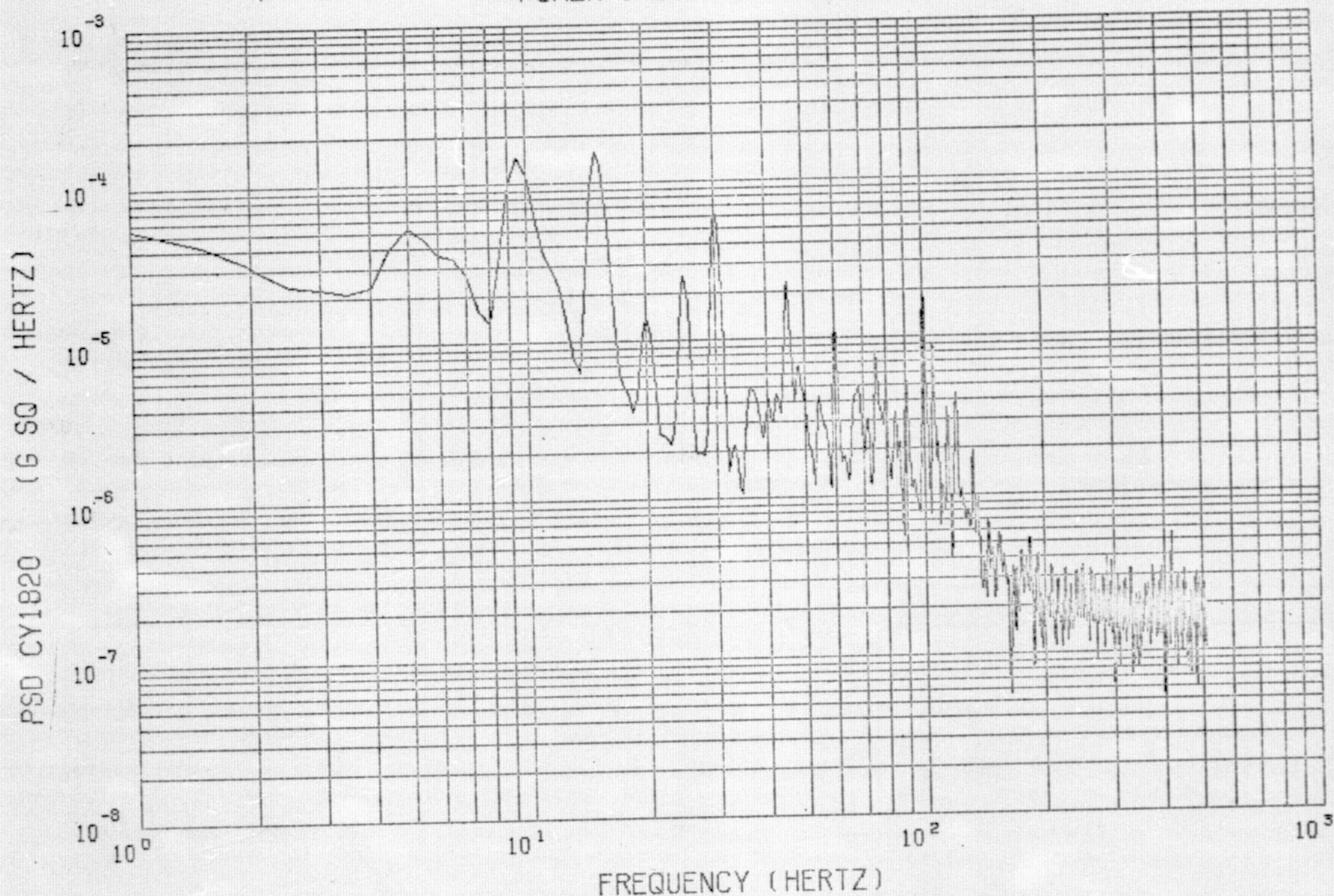
VIKING A FLT (GBI)

CENT BURN 1-0.4

CY1820

POWER SPECTRAL DENSITY

2.56



$\Delta F = .500$

START = 77406.500 SEC

STOP = 77410.500 SEC

MEAN = -14178×10^{-4}

$\sigma^2 = 13948 \times 10^{-7}$

$\sigma = 37348 \times 10^{-6}$

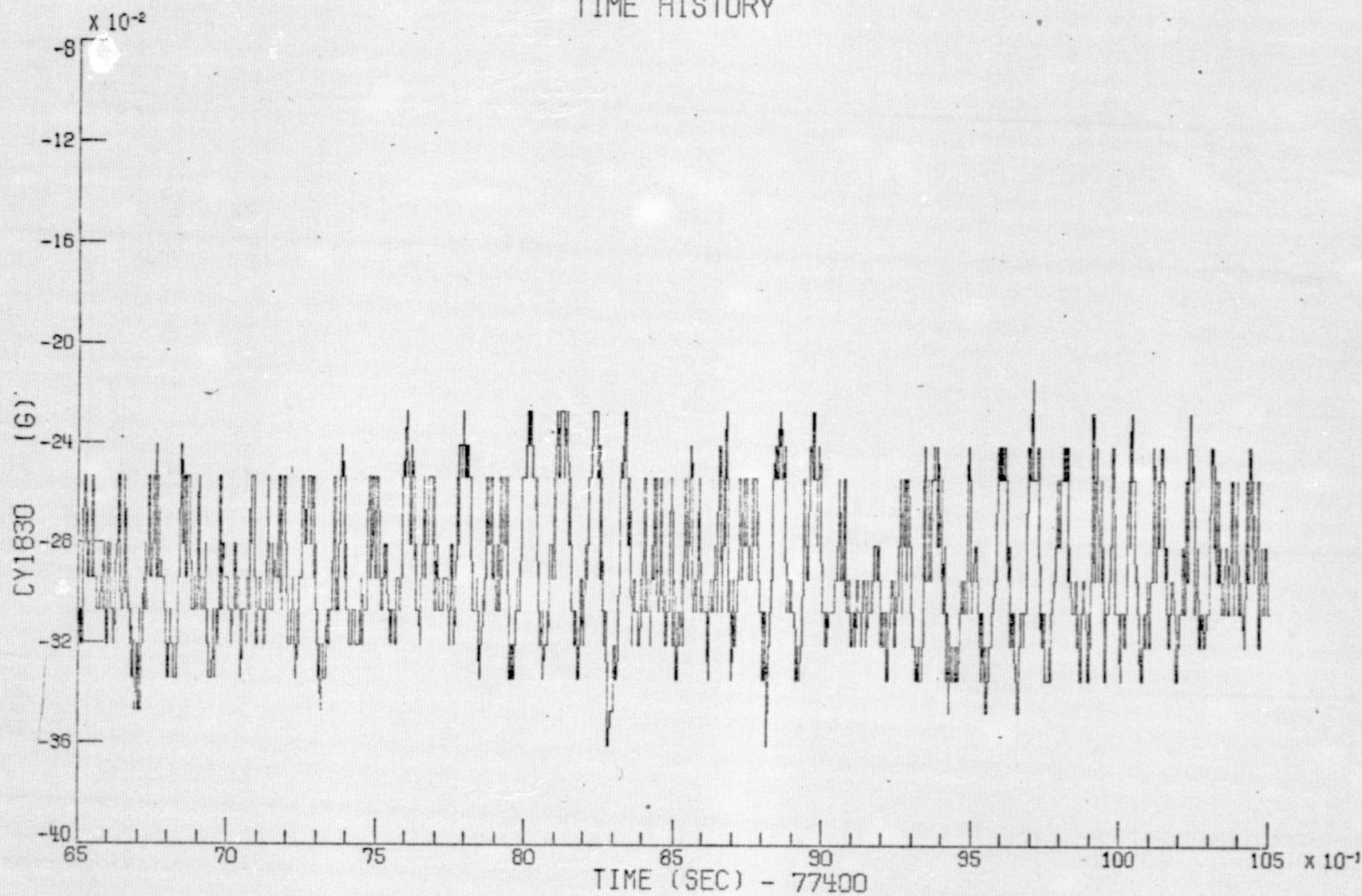
$3\sigma = 11204 \times 10^{-5}$

VIKING A FLT (GBI)

CENT BURN 1-0.4

CY1820

TIME HISTORY



MAX = -.213

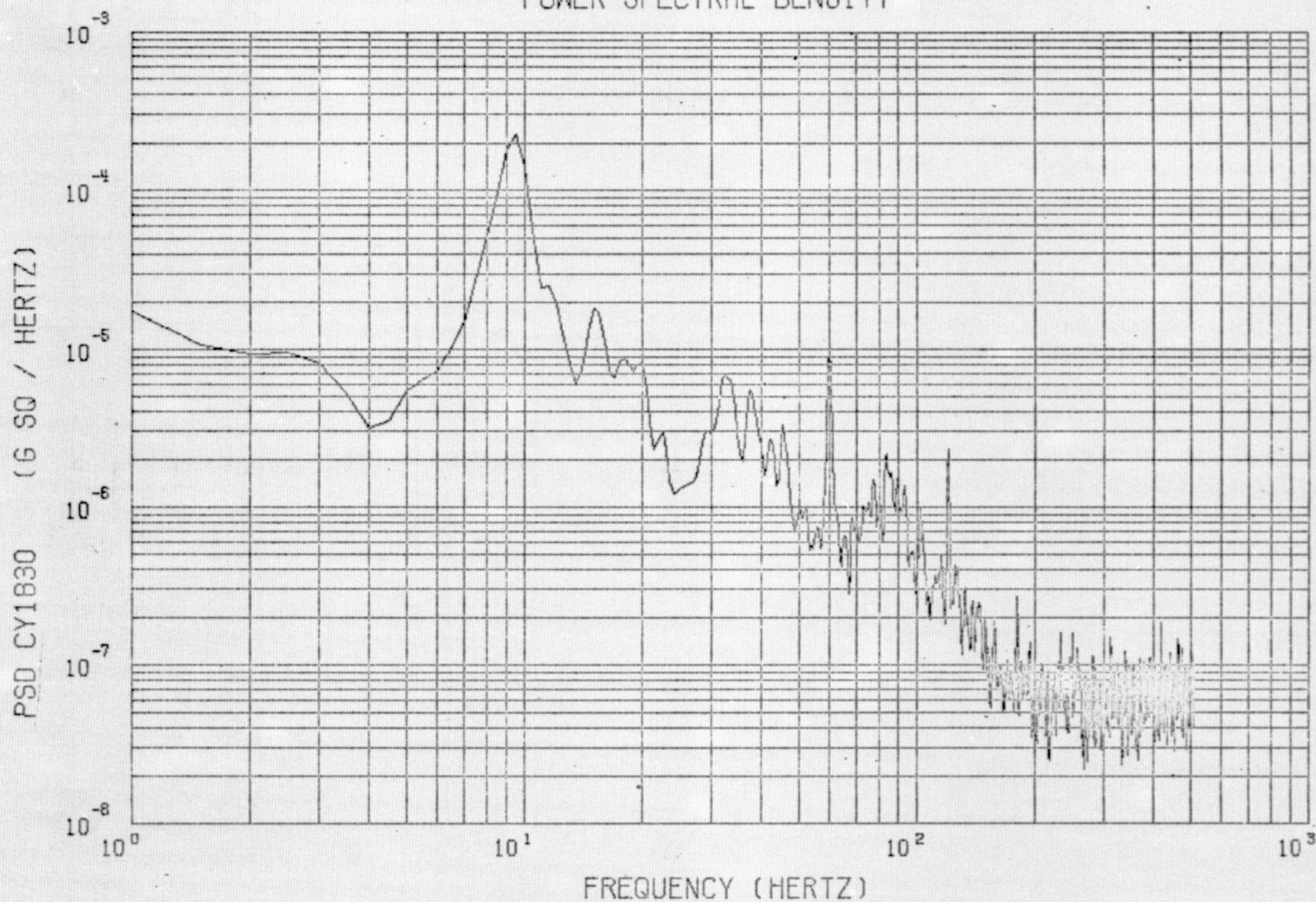
MIN = -.360 $\rightarrow \pm .074$

VIKING A FLT (GBI)

CENT BURN 1-0.4

CY1830

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77406.500 SEC

STOP = 77410.500 SEC

MEAN = -29109×10^{-5}

$\sigma^2 = 76119 \times 10^{-6}$

$\sigma = 27589 \times 10^{-6}$

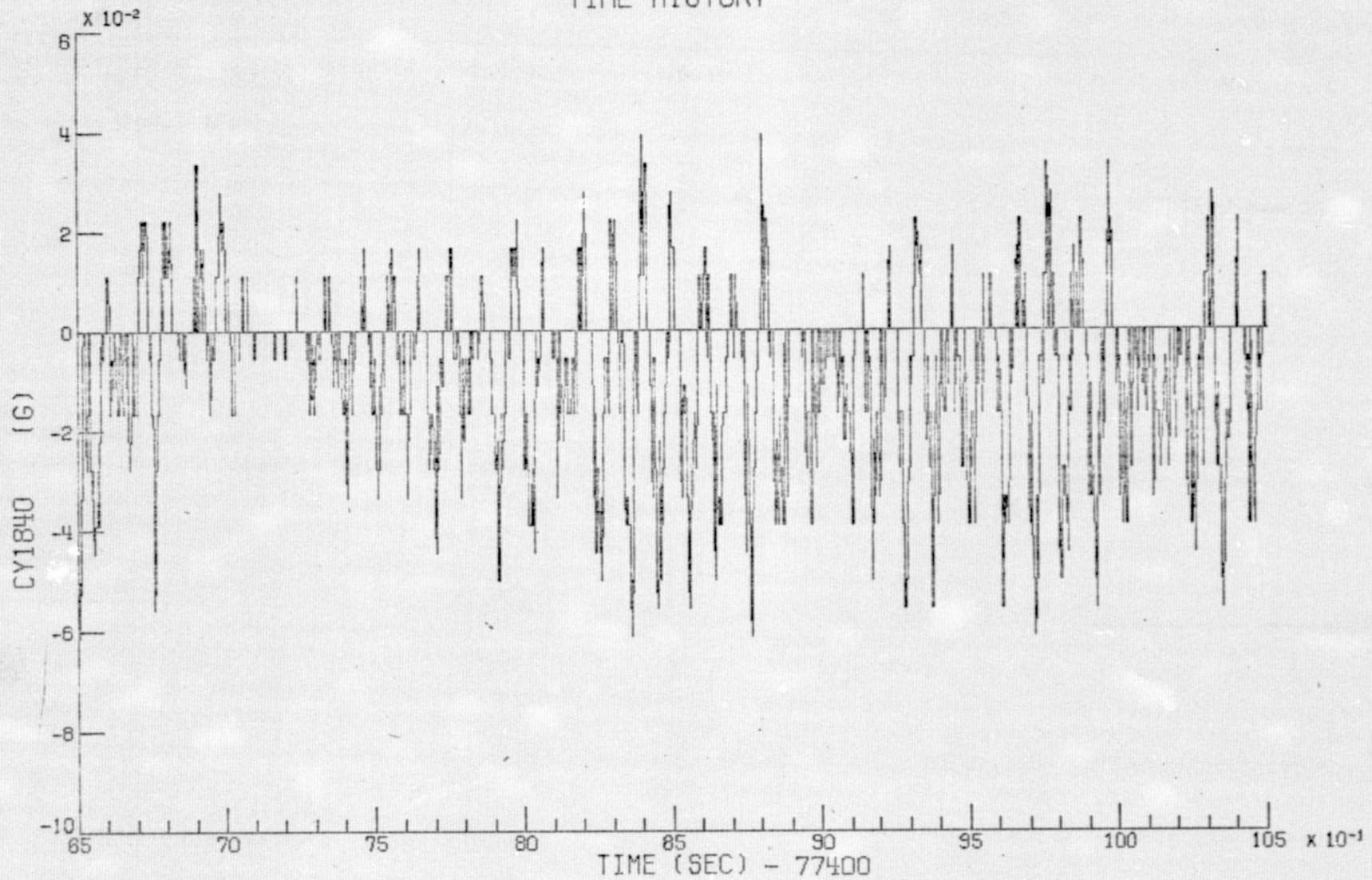
$3\sigma = 82769 \times 10^{-6}$

VIKING A FLT (GBI)

CENT BURN 1-0.4

CY1830

TIME HISTORY



MAX = .038

MIN = -.061

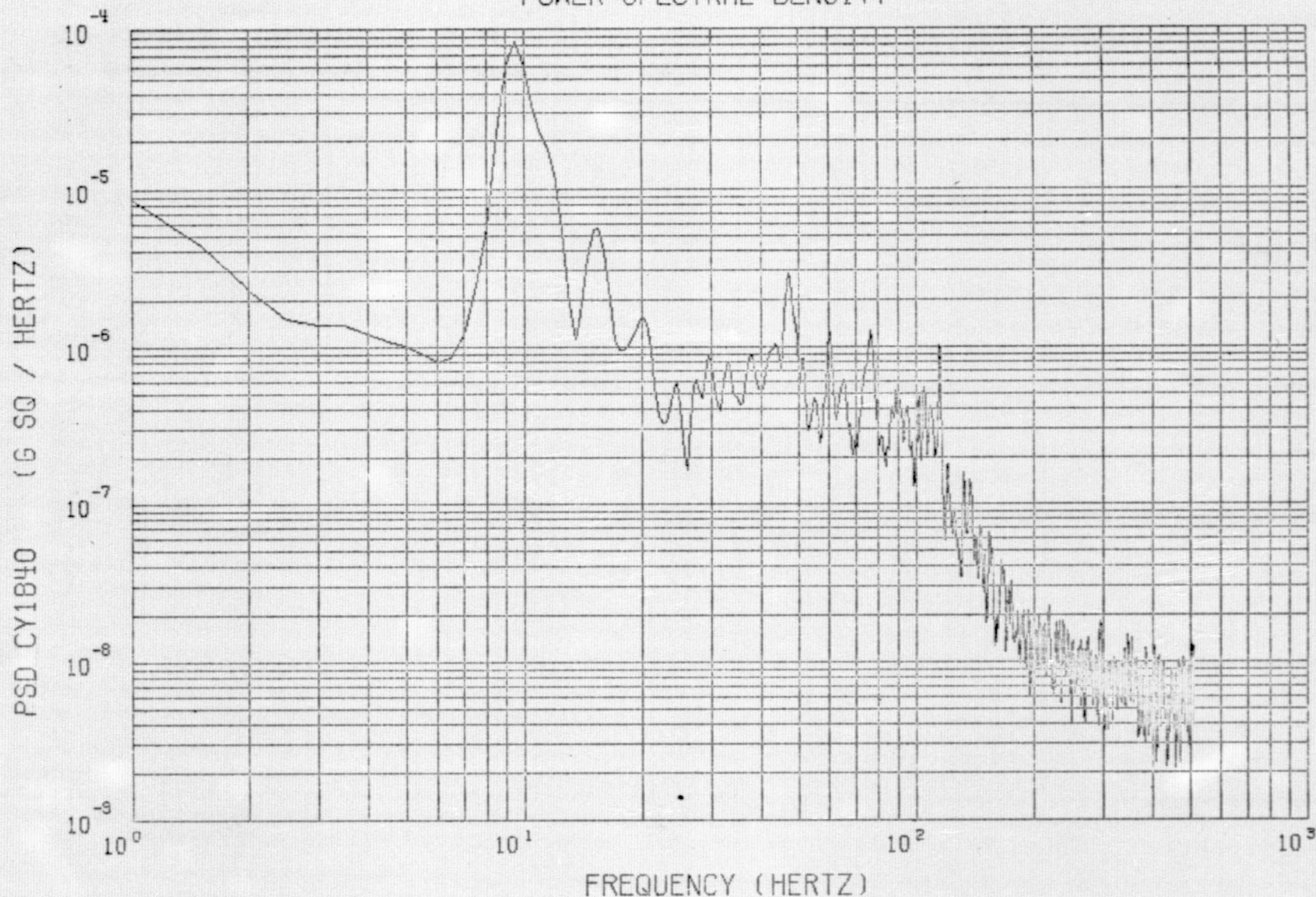
→ ± .050

VIKING A FLT (GBI)

CENT BURN 1-0.4

CY1840

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77406.500 SEC

STOP = 77410.500 SEC

MEAN = -8064×10^{-5}

$\sigma^2 = 26279 \times 10^{-5}$

$\sigma = 1621 \times 10^{-5}$

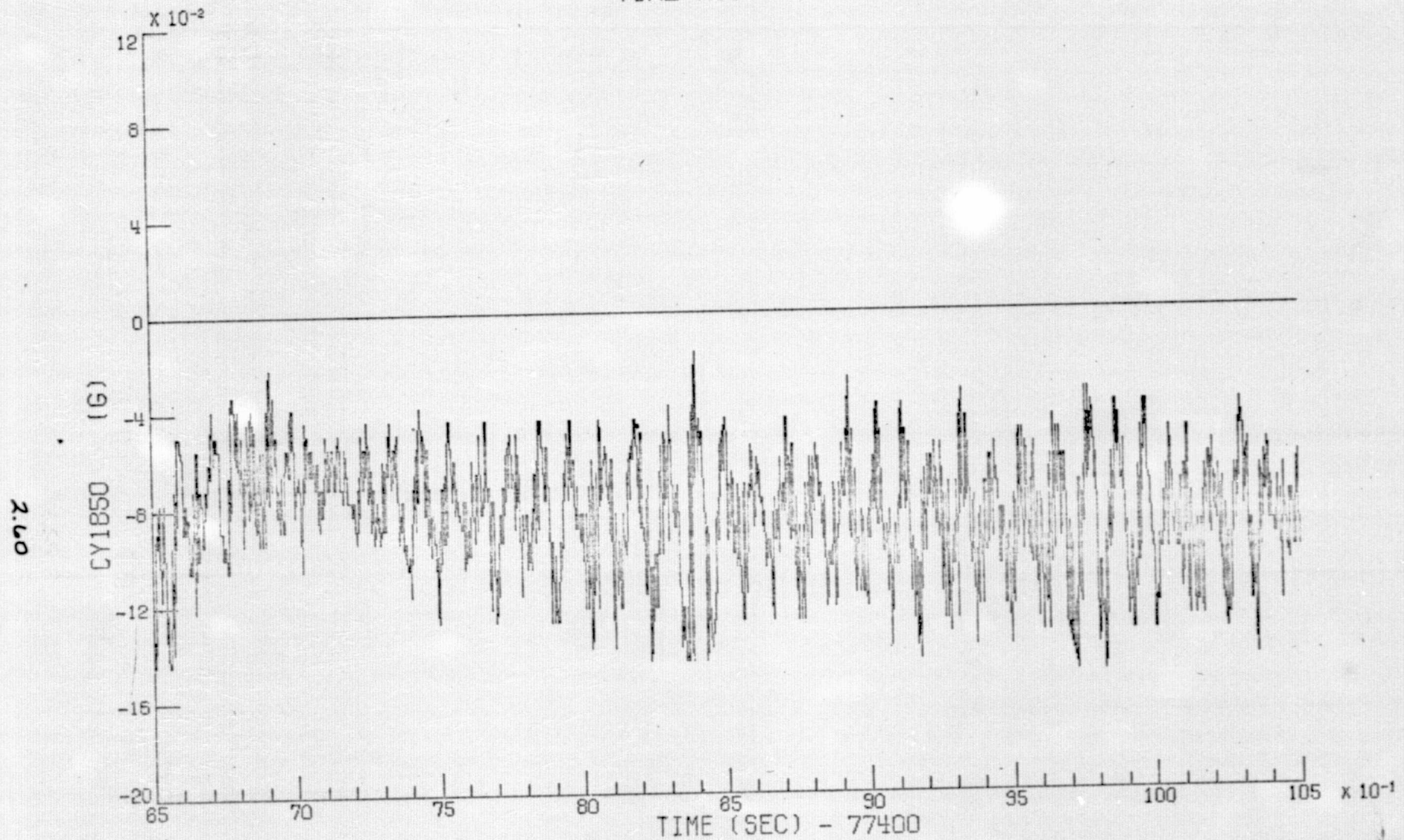
$3\sigma = 48632 \times 10^{-5}$

VIKING A FLT (GBI)

CENT BURN .1-0.4

CY1840

TIME HISTORY



MAX = -.016

MIN = -.150

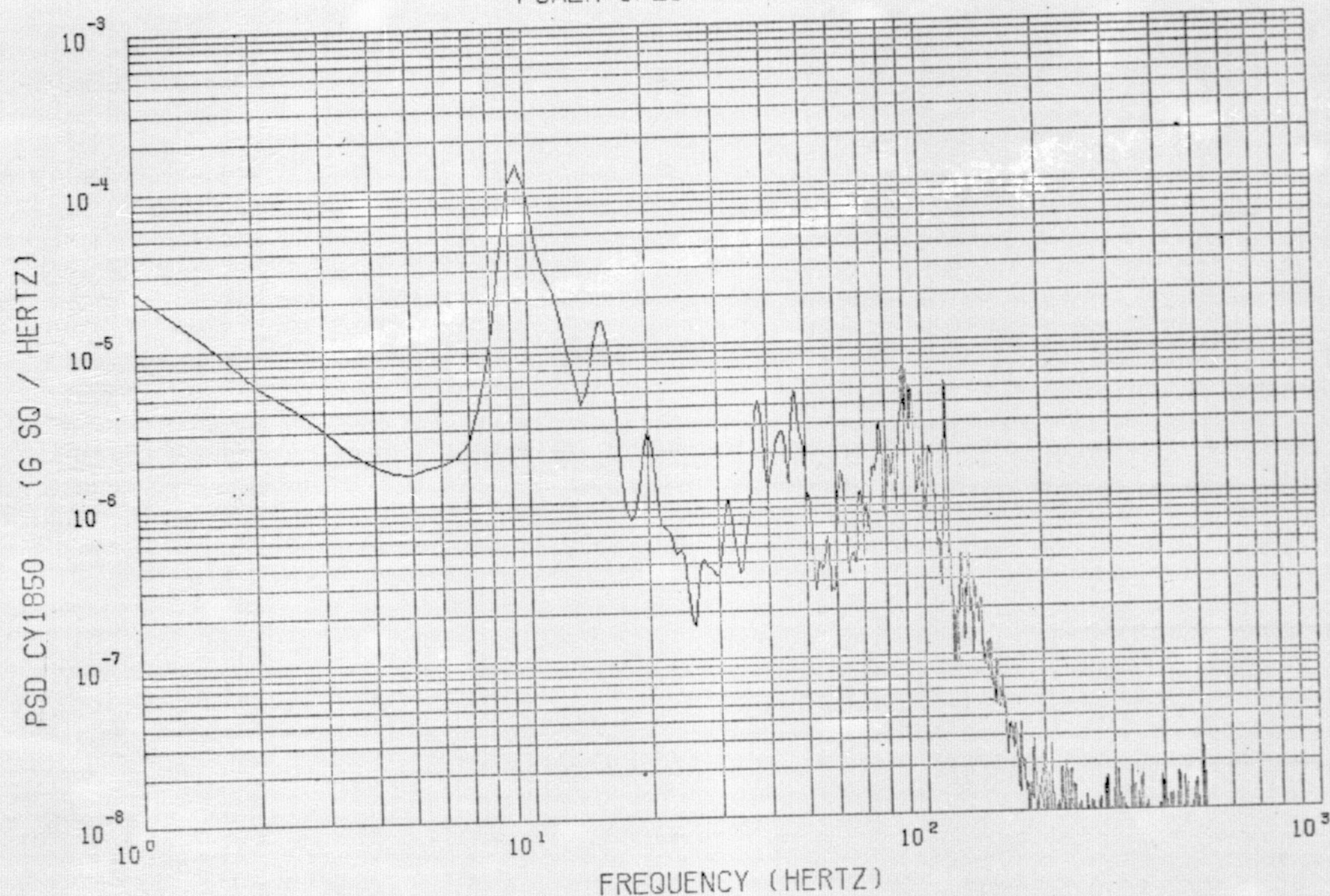
→ ±.072 g

VIKING A FLT (GBI)

CENT BURN 1-0.4

CY1850

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77406.500 SEC

STOP = 77410.500 SEC

MEAN = -83562×10^{-6}

$\sigma^2 = 51683 \times 10^{-6}$

$\sigma = 22734 \times 10^{-6}$

$3\sigma = 68202 \times 10^{-6}$

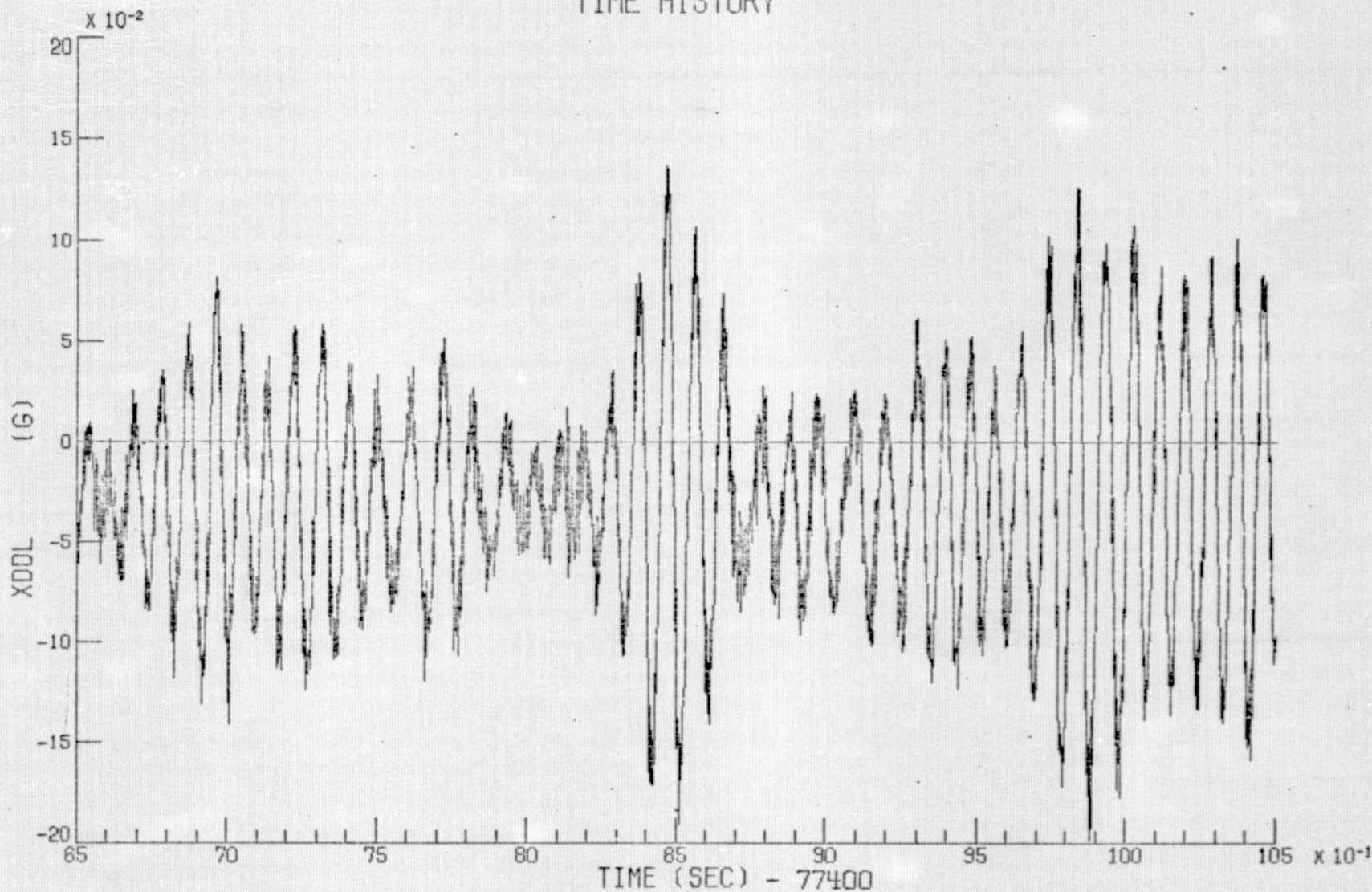
VIKING A FLT (GBI)

CENT BURN 1-0.4

CY1850

TIME HISTORY

2.62



MAX = .136

MIN = -.198



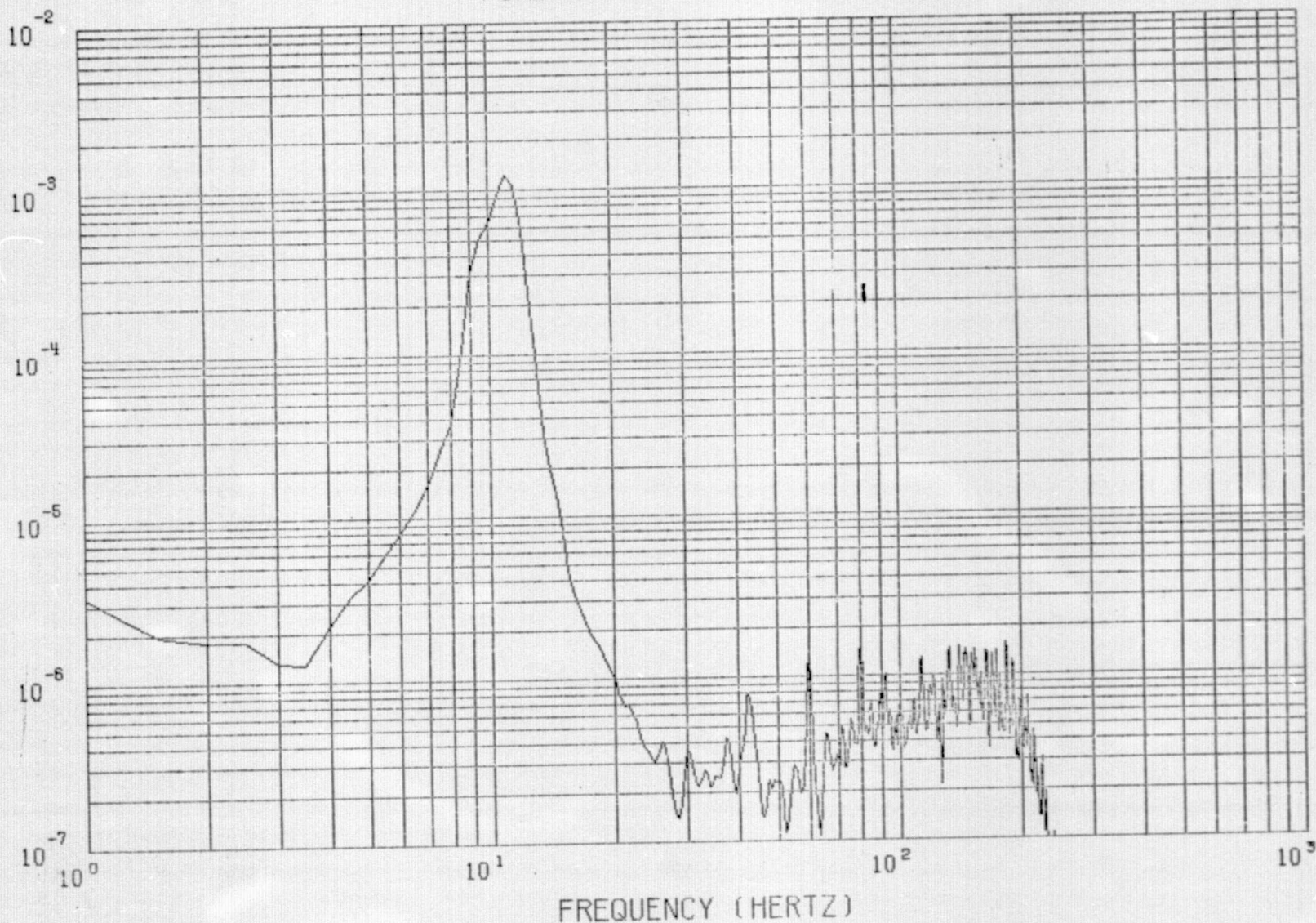
VIKING A FLT (GBI)

CENT BURN 1-0.4

XDDL

POWER SPECTRAL DENSITY

2.63
PSD XDDL (G SQ / HERTZ)



$\Delta F = .500$

START = 77406.500 SEC

STOP = 77410.500 SEC

MEAN = -29674×10^{-6}

$\sigma^2 = 30838 \times 10^{-7}$

$\sigma = 55532 \times 10^{-8}$

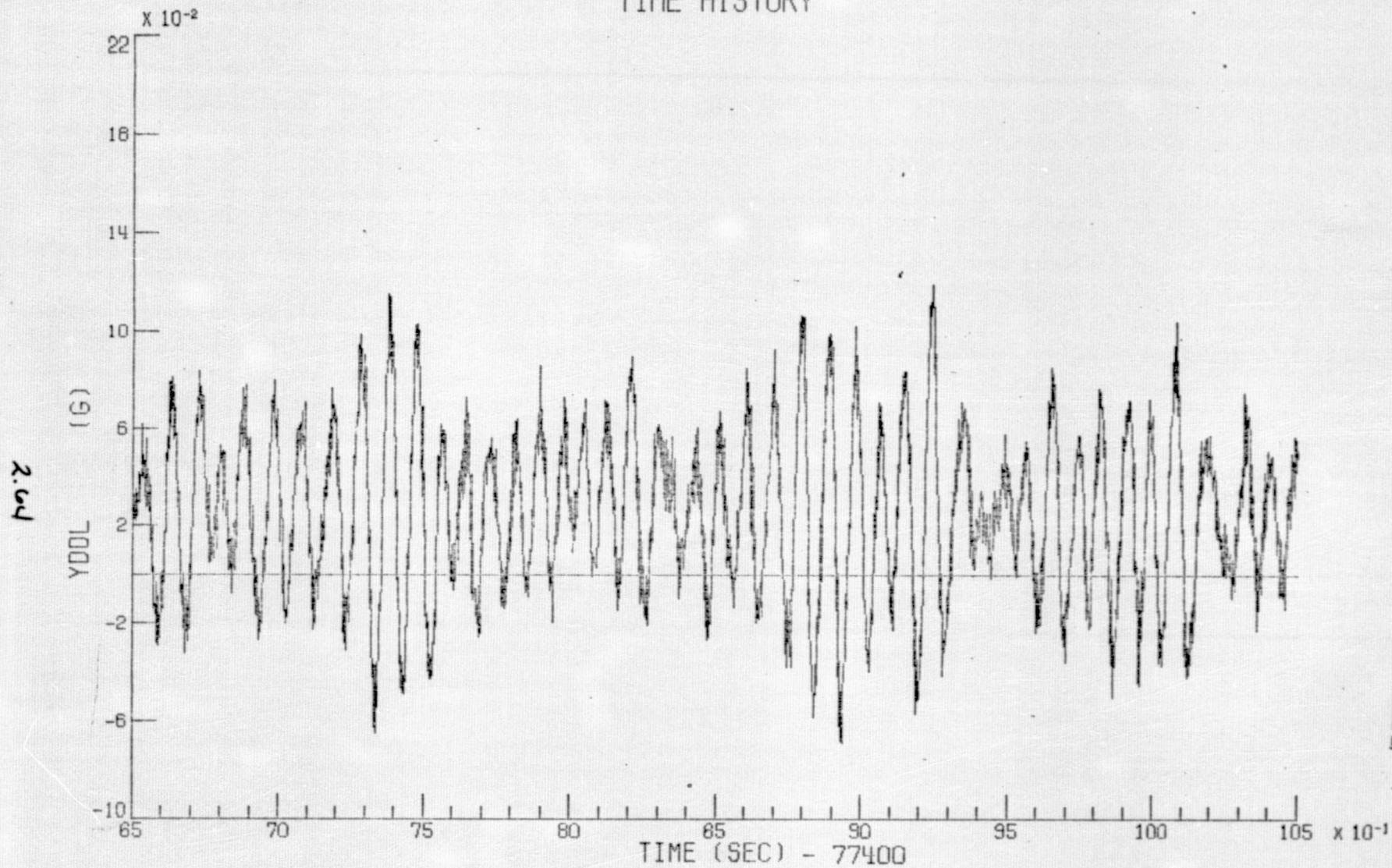
$3\sigma = 16659 \times 10^{-8}$

VIKING A FLT (GBI)

CENT BURN 1-0.4

XDDL

TIME HISTORY



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OF POOR QUALITY

MAX = .119

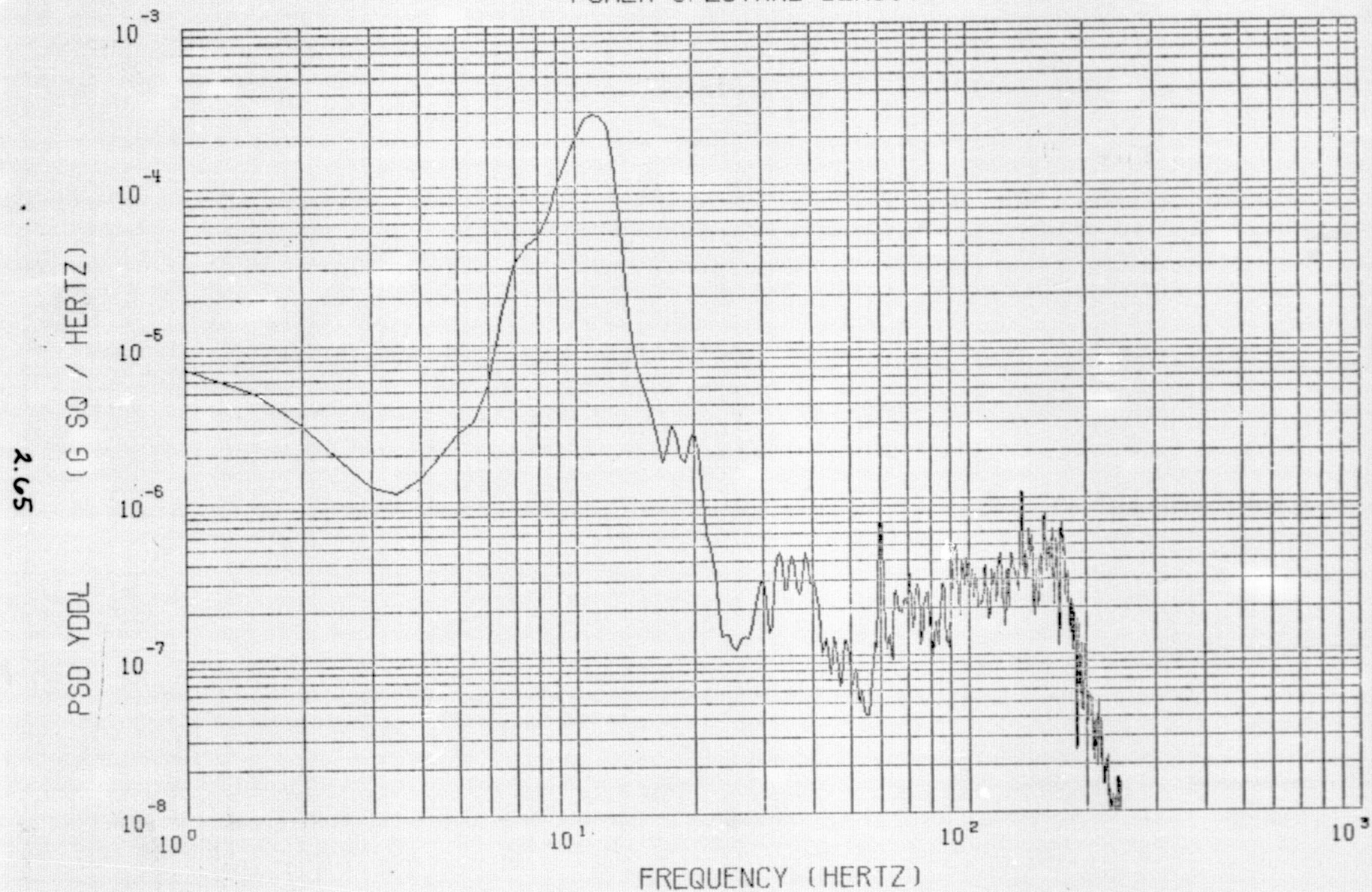
MIN = -.068 $\rightarrow \pm 0.0948$

VIKING A FLT (GB1)

CENT BURN 1-0.4

YDDL

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77406.500 SEC

STOP = 77410.500 SEC

MEAN = 25811×10^{-5}

$\sigma^2 = 10744 \times 10^{-7}$

$\sigma = 32779 \times 10^{-5}$

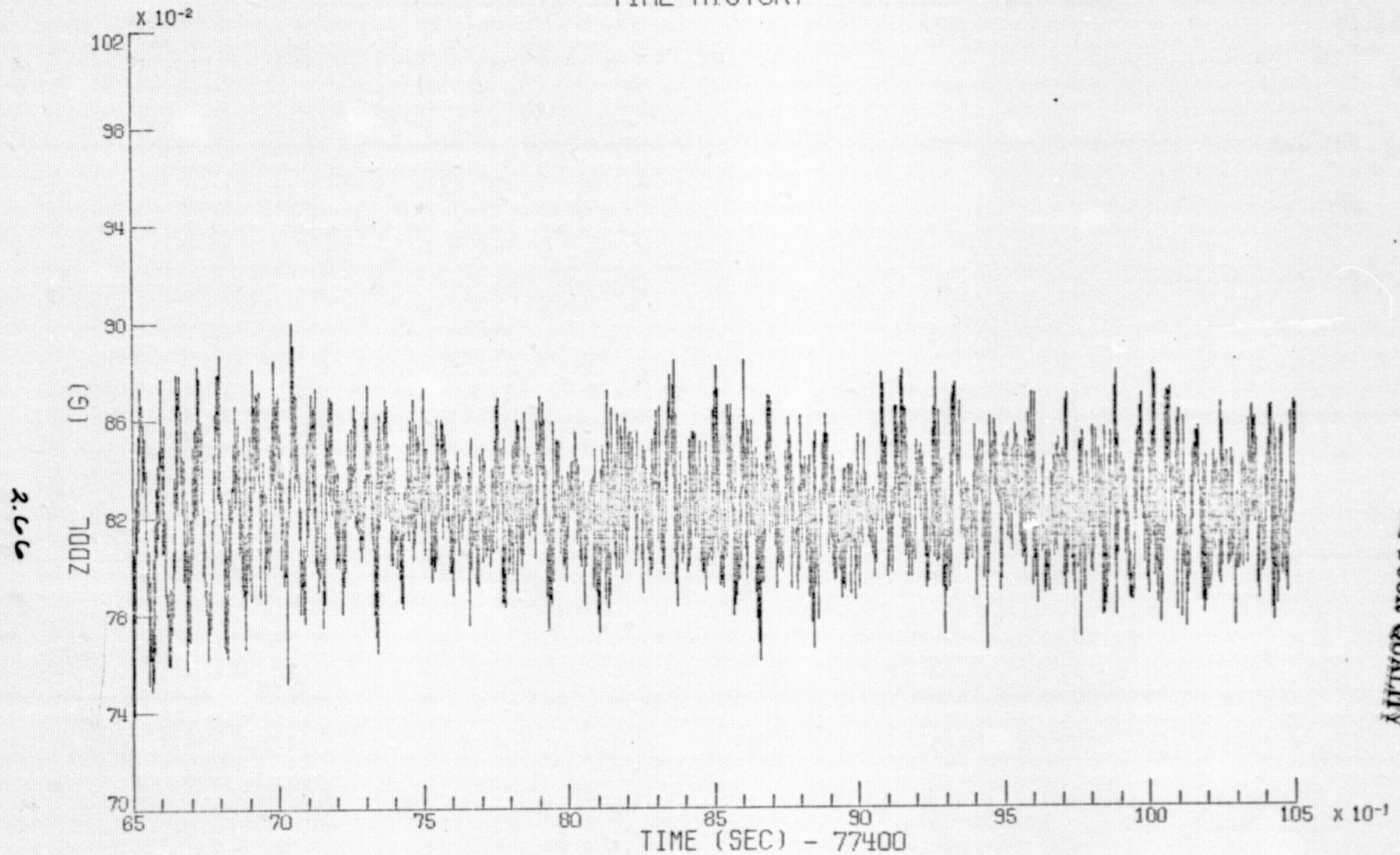
$3\sigma = 98338 \times 10^{-5}$

VIKING A FLT (GBI)

CENT BURN 1-0.4

YDDL

TIME HISTORY



MAX = .900

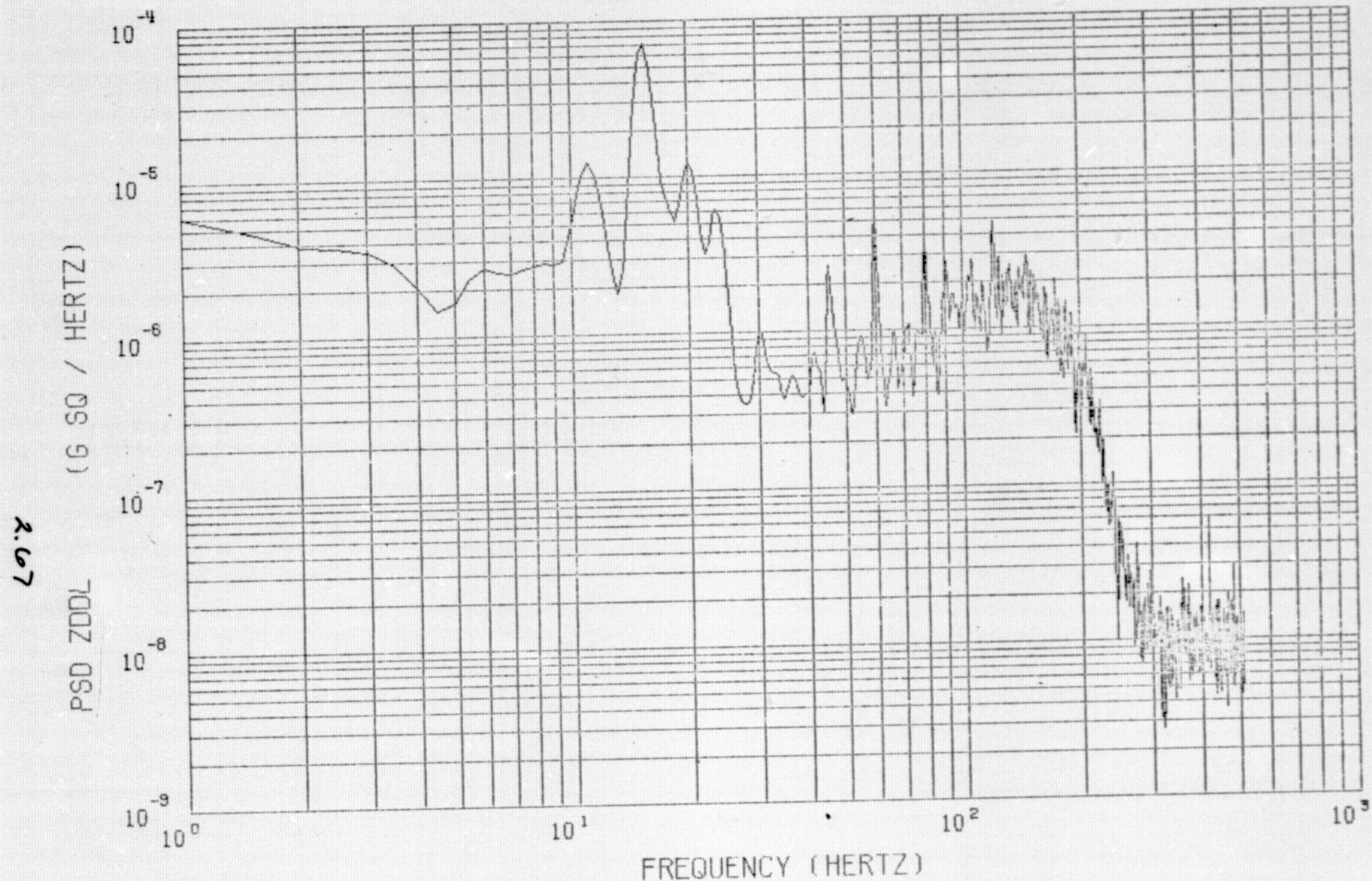
MIN = .728 → 1.086

VIKING A FLT (GBI)

CENT BURN 1-0.4

ZDDL

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77406.500 SEC

STOP = 77410.500 SEC

MEAN = 8241×10^{-4}

$\sigma^2 = 45591 \times 10^{-6}$

$\sigma = 21352 \times 10^{-6}$

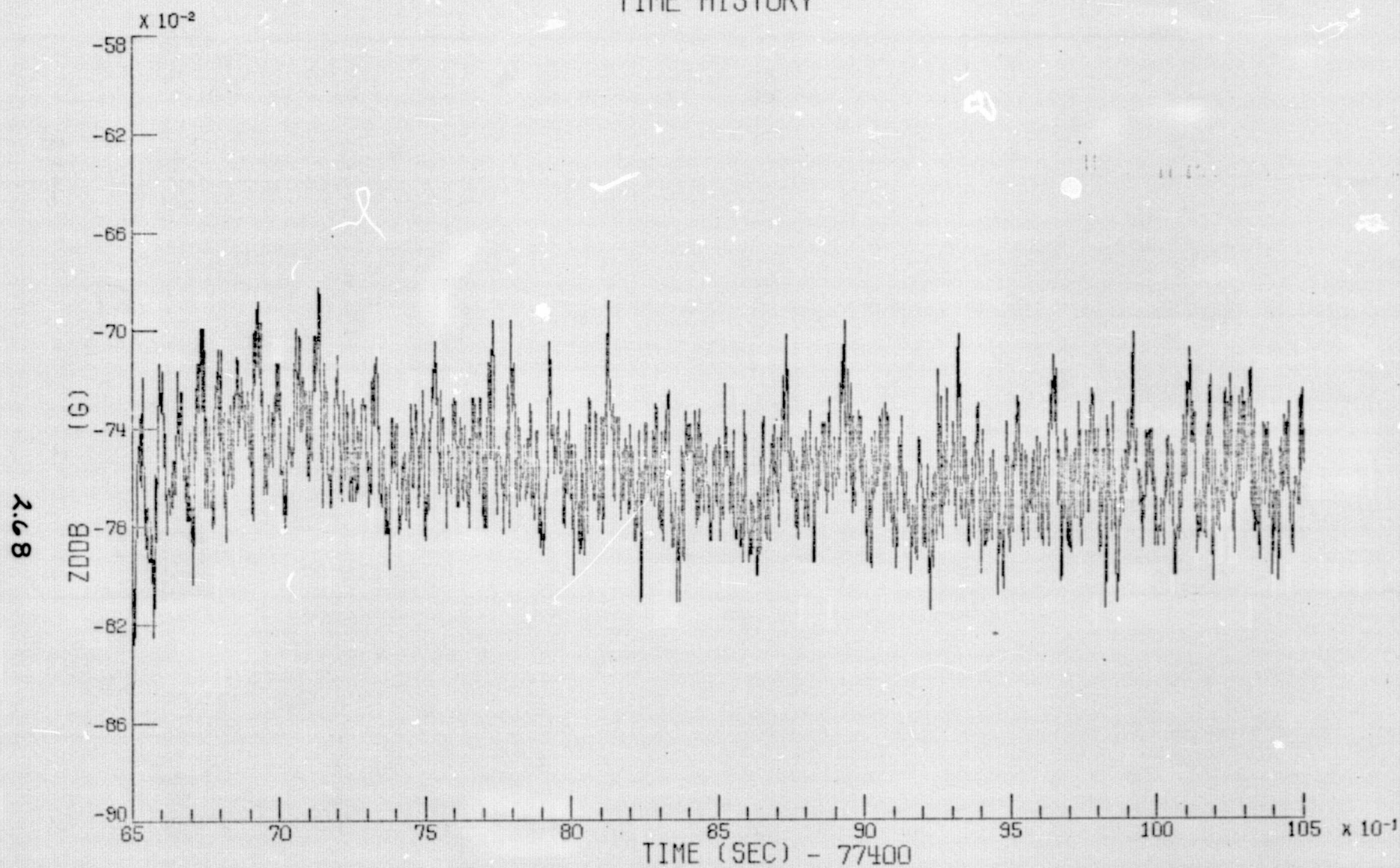
$3\sigma = 64056 \times 10^{-6}$

VIKING A FLT (GBI)

CENT BURN 1-0.4

ZDDL

TIME HISTORY



MAX = -.682

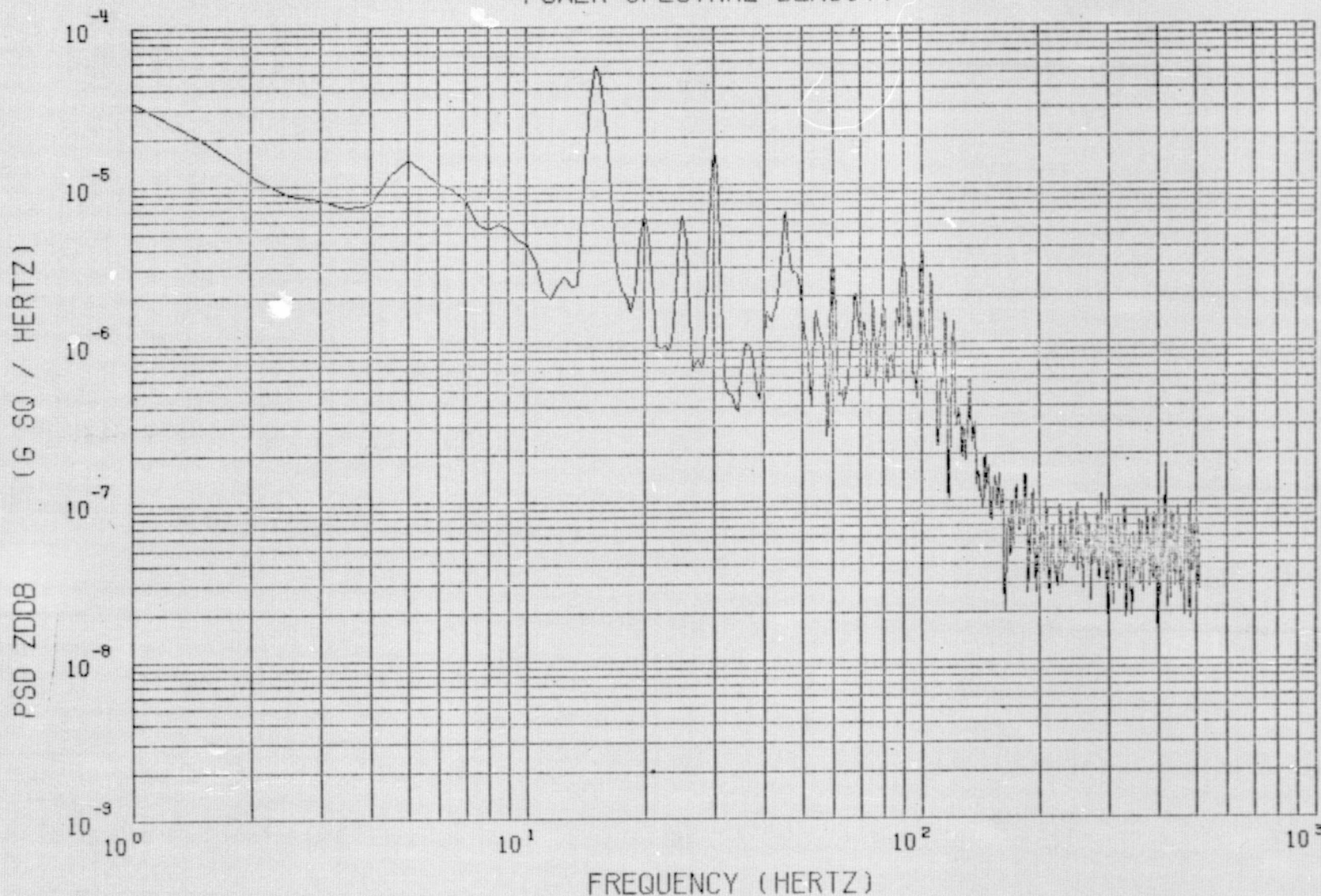
MIN = -.827

VIKING A FLT (GBI)

CENT BURN 1-0.4

ZDOB

POWER SPECTRAL DENSITY



$\Delta F = .500$

START = 77406.500 SEC

STOP = 77410.500 SEC

MEAN = -75598×10^{-9}

$\sigma^2 = 42922 \times 10^{-6}$

$\sigma = 20717 \times 10^{-6}$

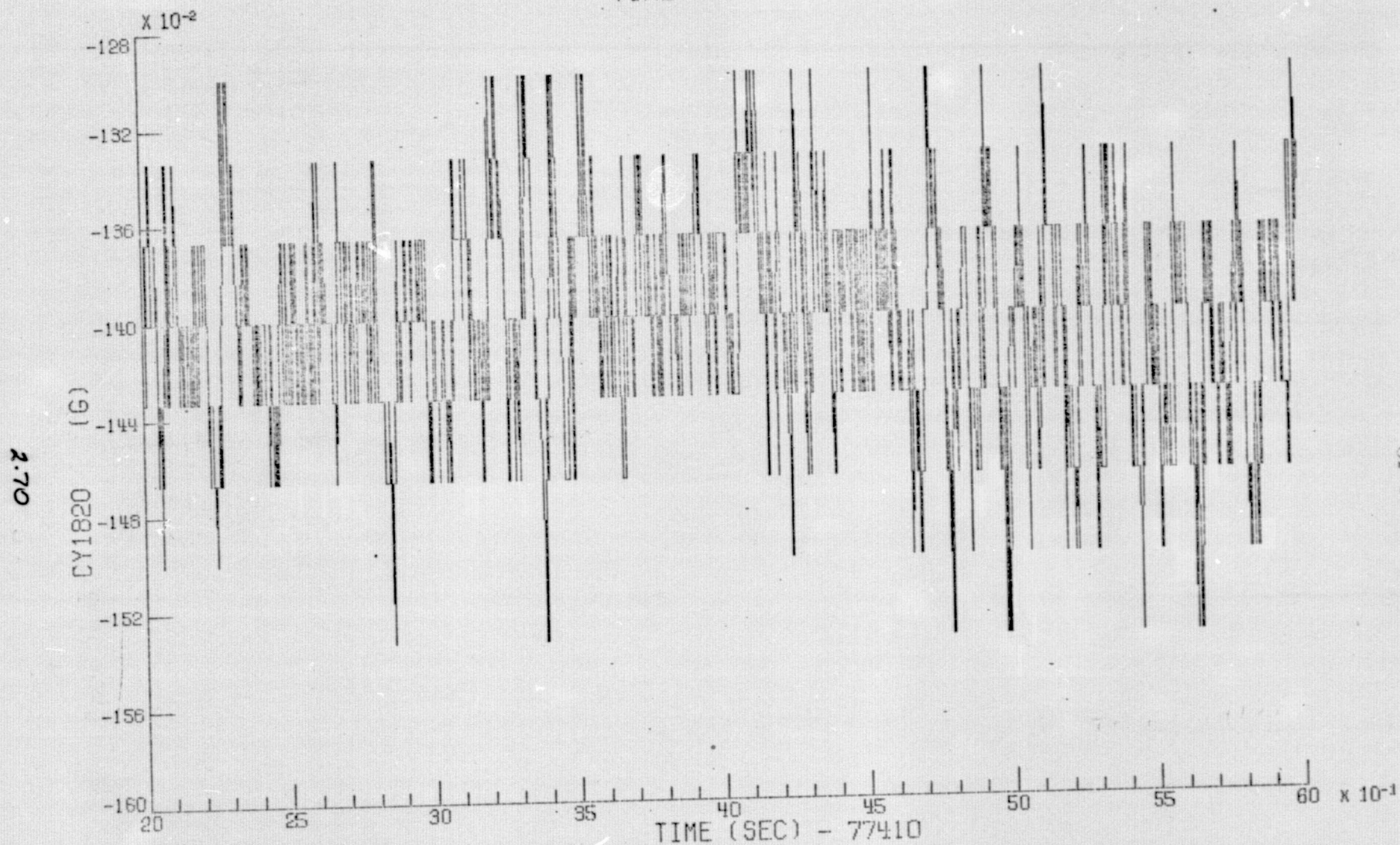
$3\sigma = 62152 \times 10^{-6}$

VIKING A FLT (GBI)

CENT BURN 1-0.4

ZODB

TIME HISTORY



MAX = -1.300

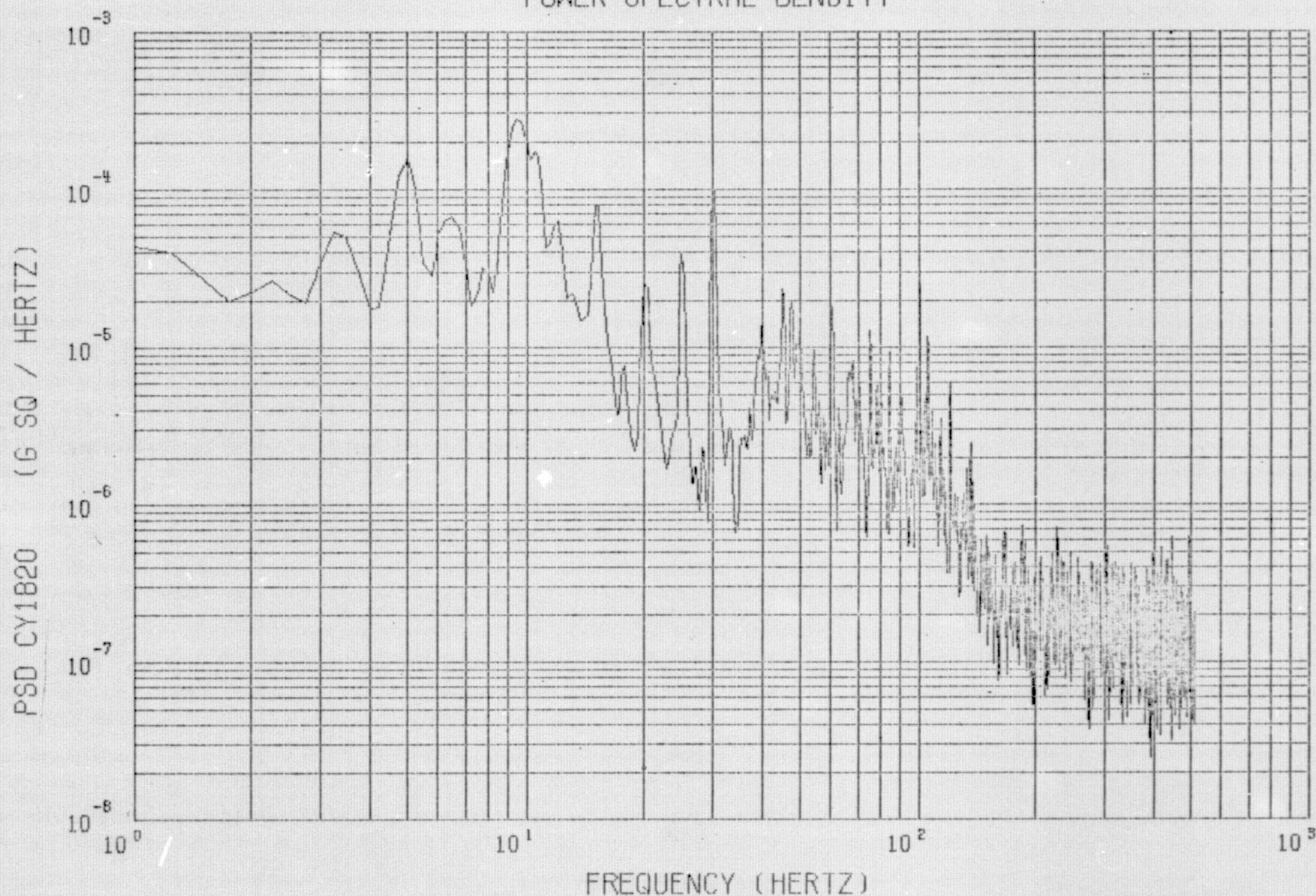
MIN = -1.533 → ± .117 g

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY1820

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -14036×10^{-4}

$\sigma^2 = 17285 \times 10^{-7}$

$\sigma = 41575 \times 10^{-6}$

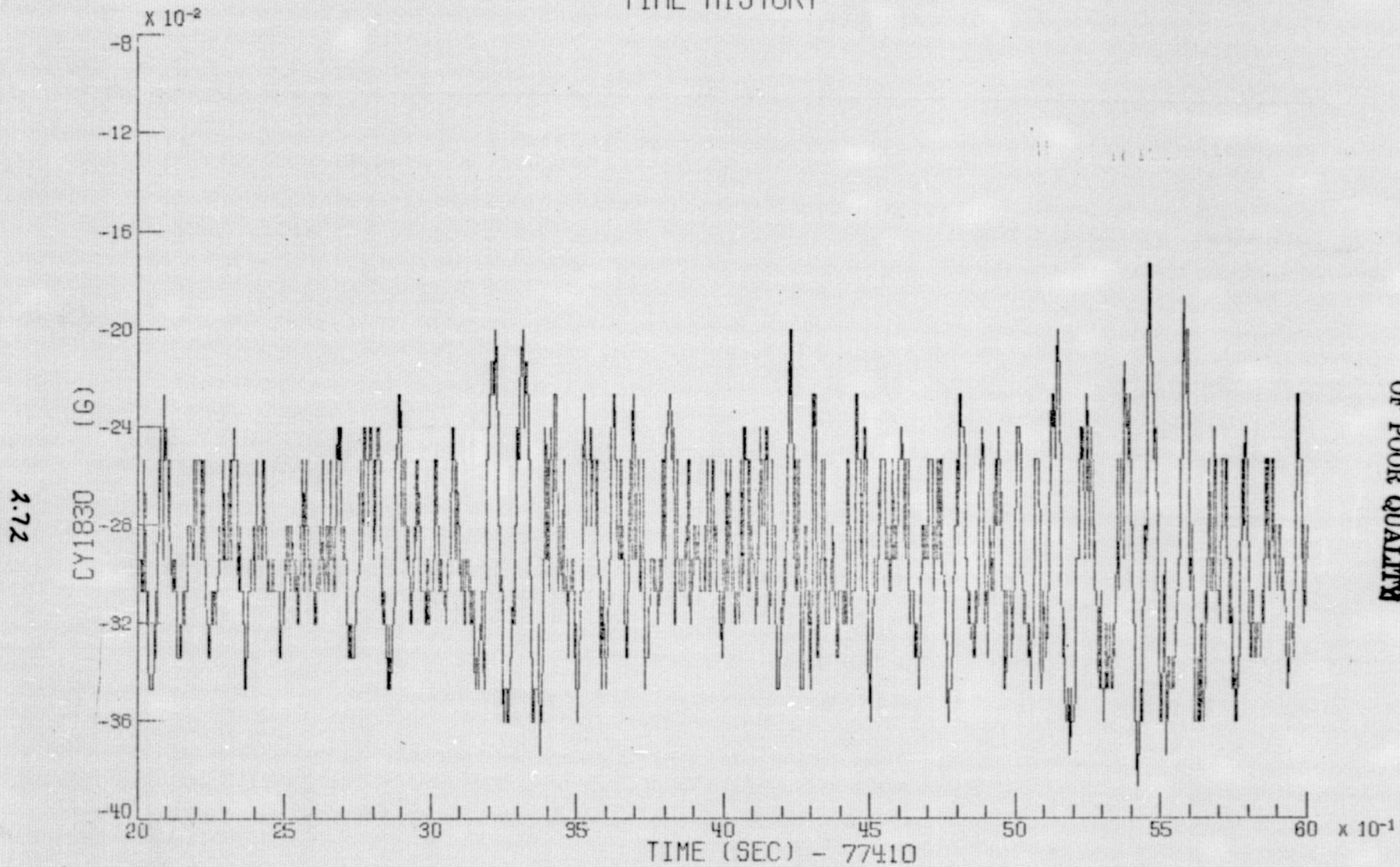
$3\sigma = 12472 \times 10^{-5}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY1820

TIME HISTORY



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MAX = -.173

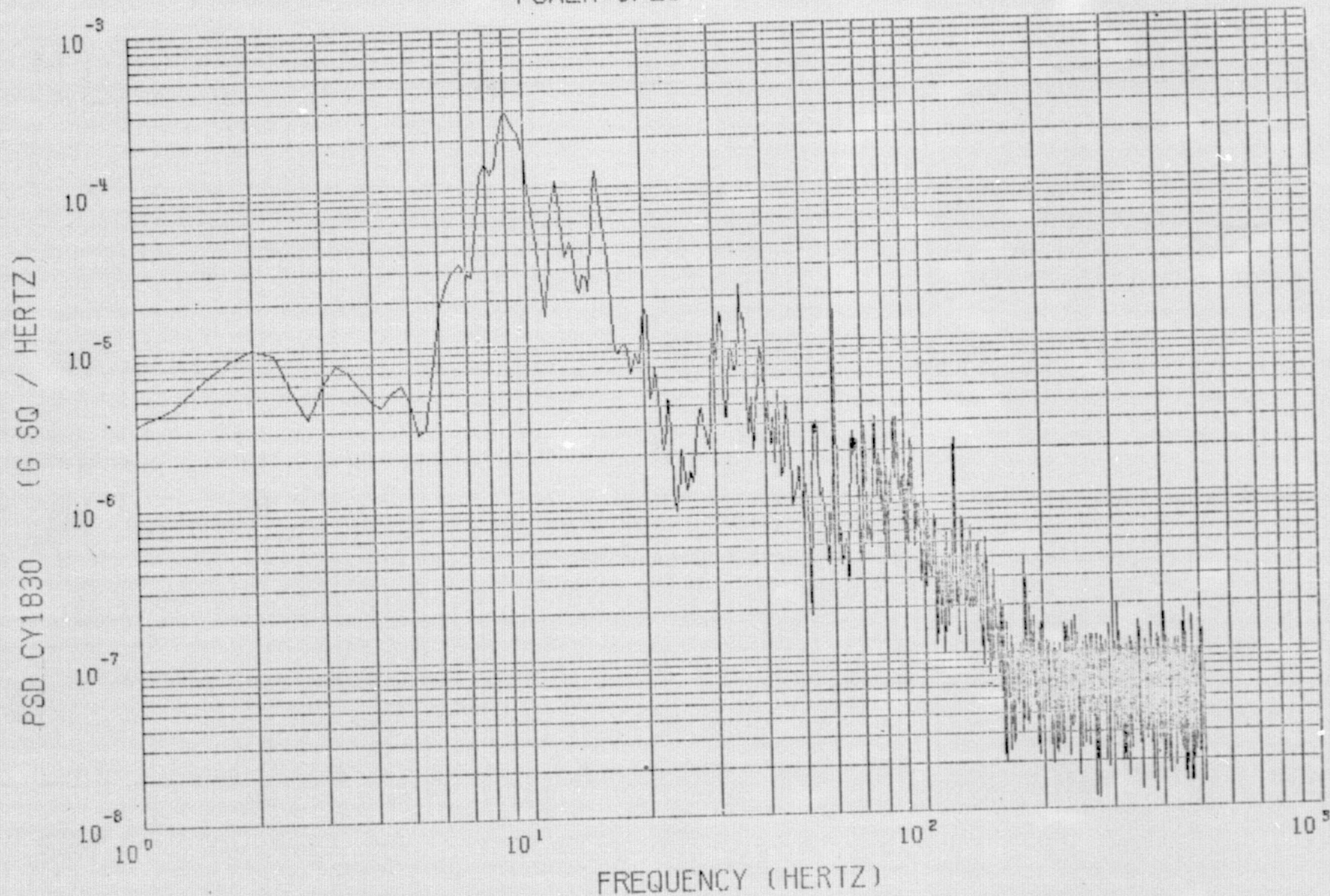
MIN = -.387

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY1830

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -29309×10^{-5}

$\sigma^2 = 12074 \times 10^{-7}$

$\sigma = 34749 \times 10^{-6}$

$3\sigma = 10424 \times 10^{-5}$

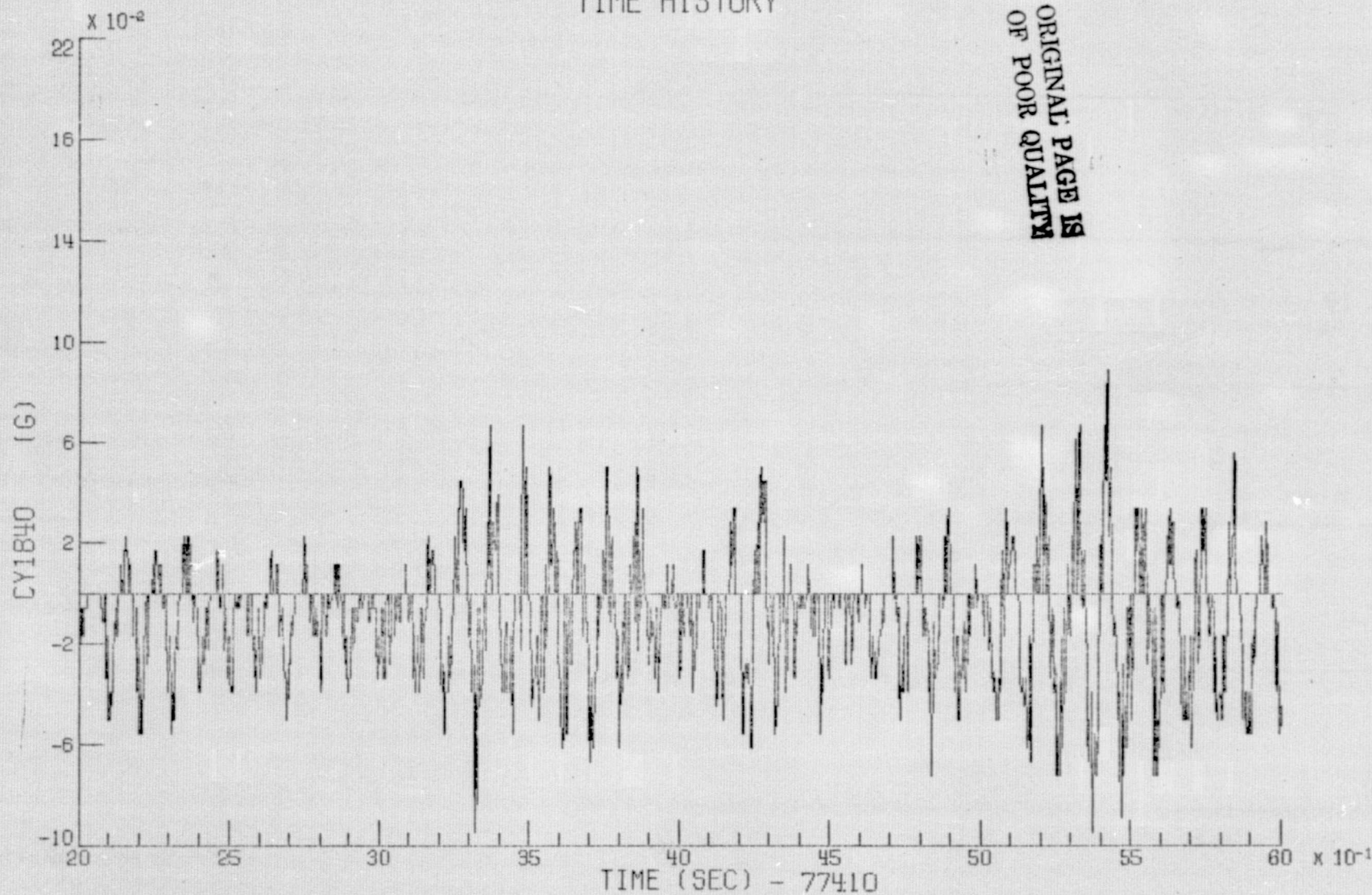
VIKING A FLT (GB1)

CENT BURN 1-1.4

CY1830

TIME HISTORY

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OF POOR QUALITY



MAX = .089

MIN = -.094 $\rightarrow \pm .092 g$

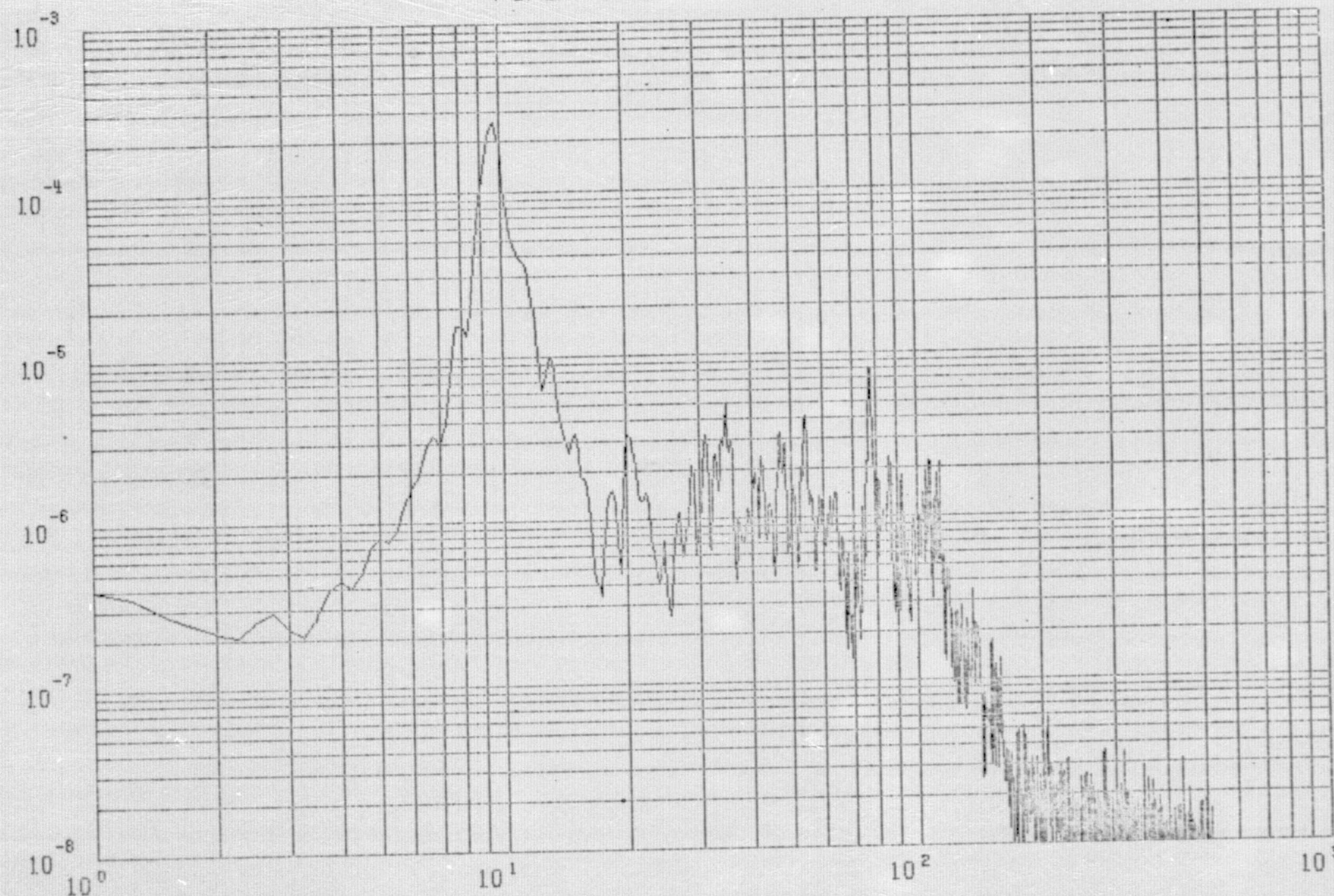
VIKING A FLT (GBI)

CENT BURN 1-1.4

CY1840

POWER SPECTRAL DENSITY

PSD CY1840 (G SQ / HERTZ)
2.75



FREQUENCY (HERTZ)

$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -93842×10^{-7}

$\sigma^2 = 51558 \times 10^{-8}$

$\sigma = 22706 \times 10^{-8}$

$3\sigma = 68119 \times 10^{-8}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

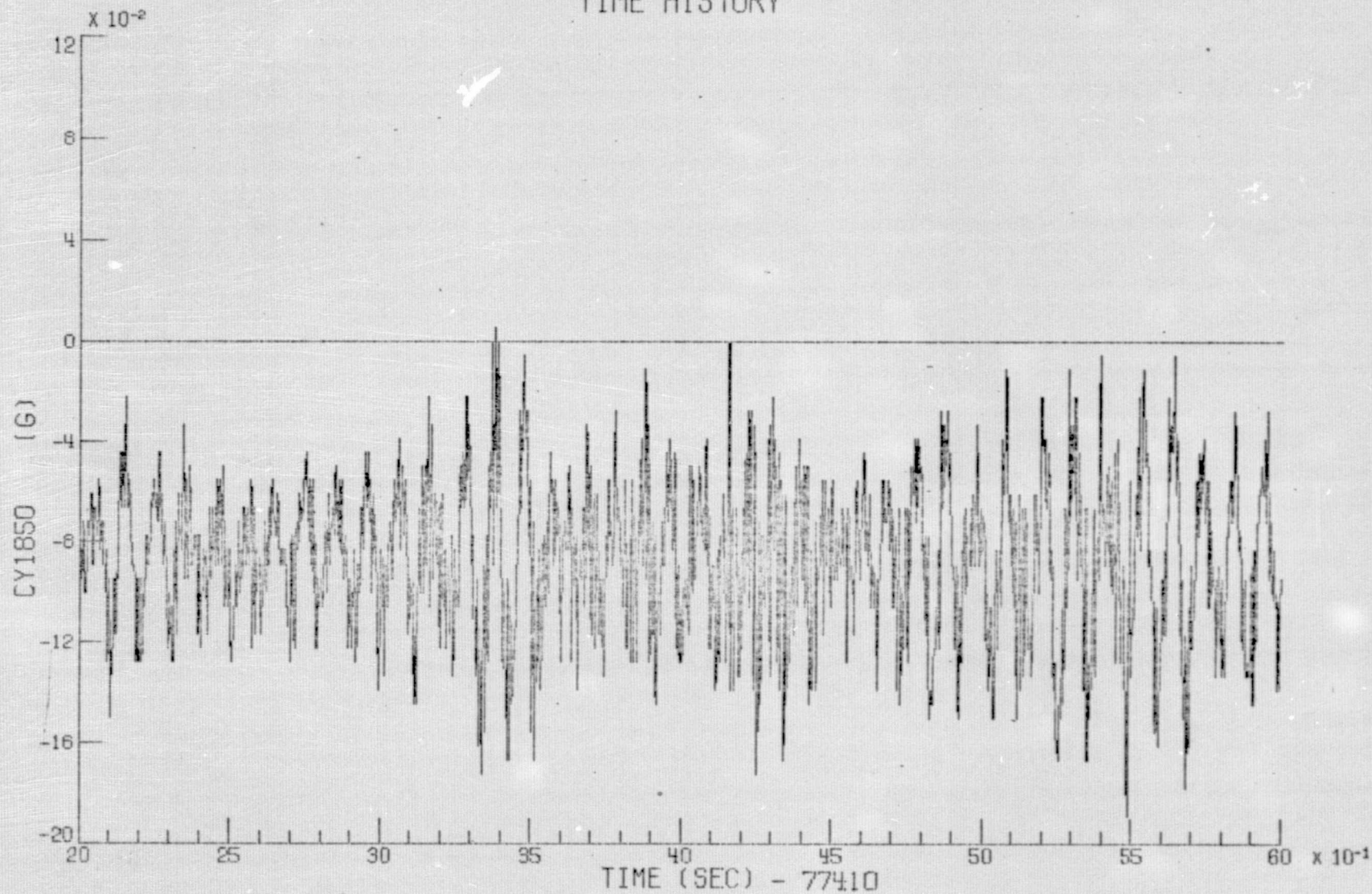
CY1840

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FIGURE 2.36b

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OF POOR QUALITY

TIME HISTORY



MAX = .005

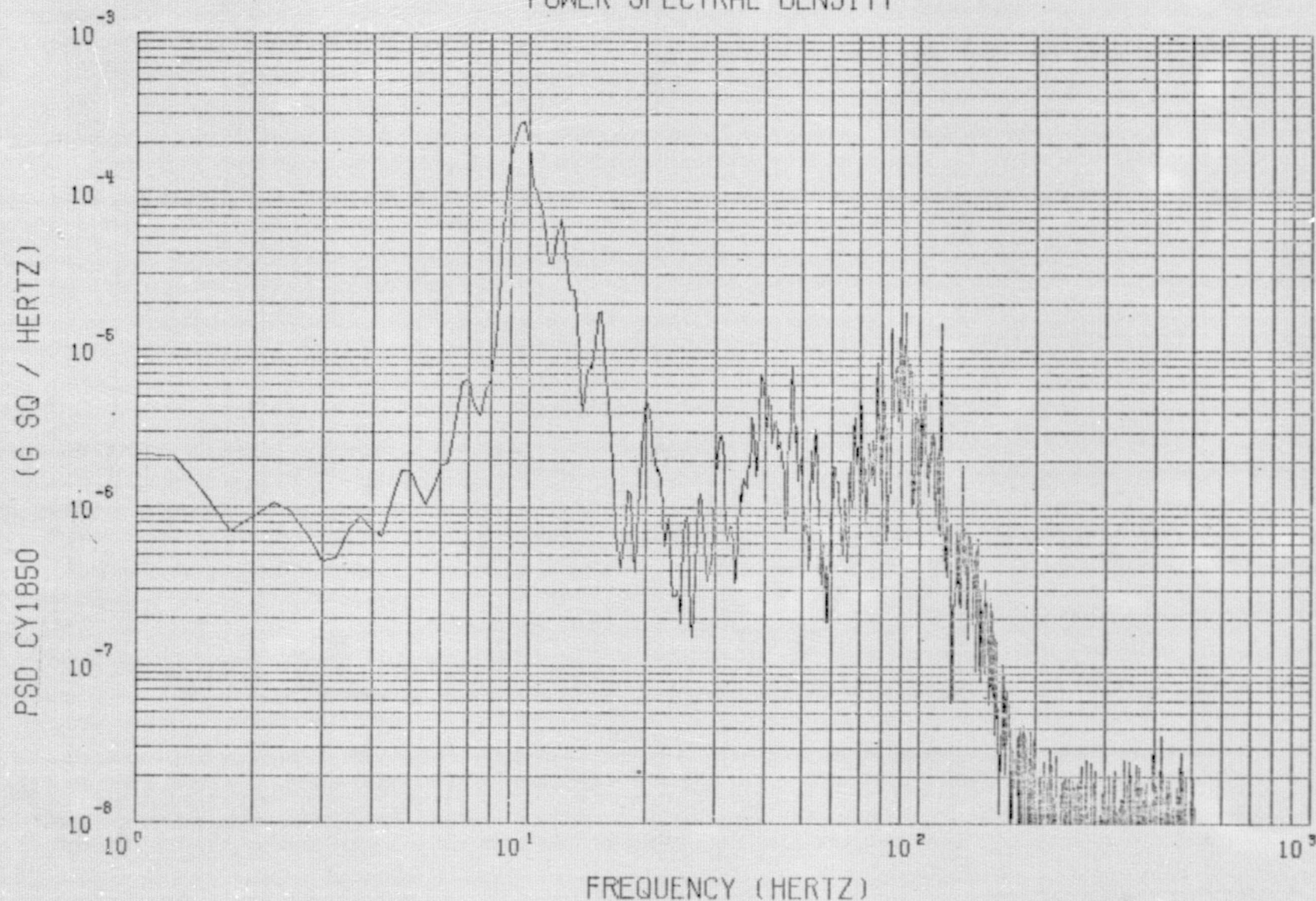
MIN = -.188

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY1850

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -86125×10^{-6}

$\sigma^2 = 81711 \times 10^{-11}$

$\sigma = 28585 \times 10^{-6}$

$3\sigma = 85755 \times 10^{-6}$

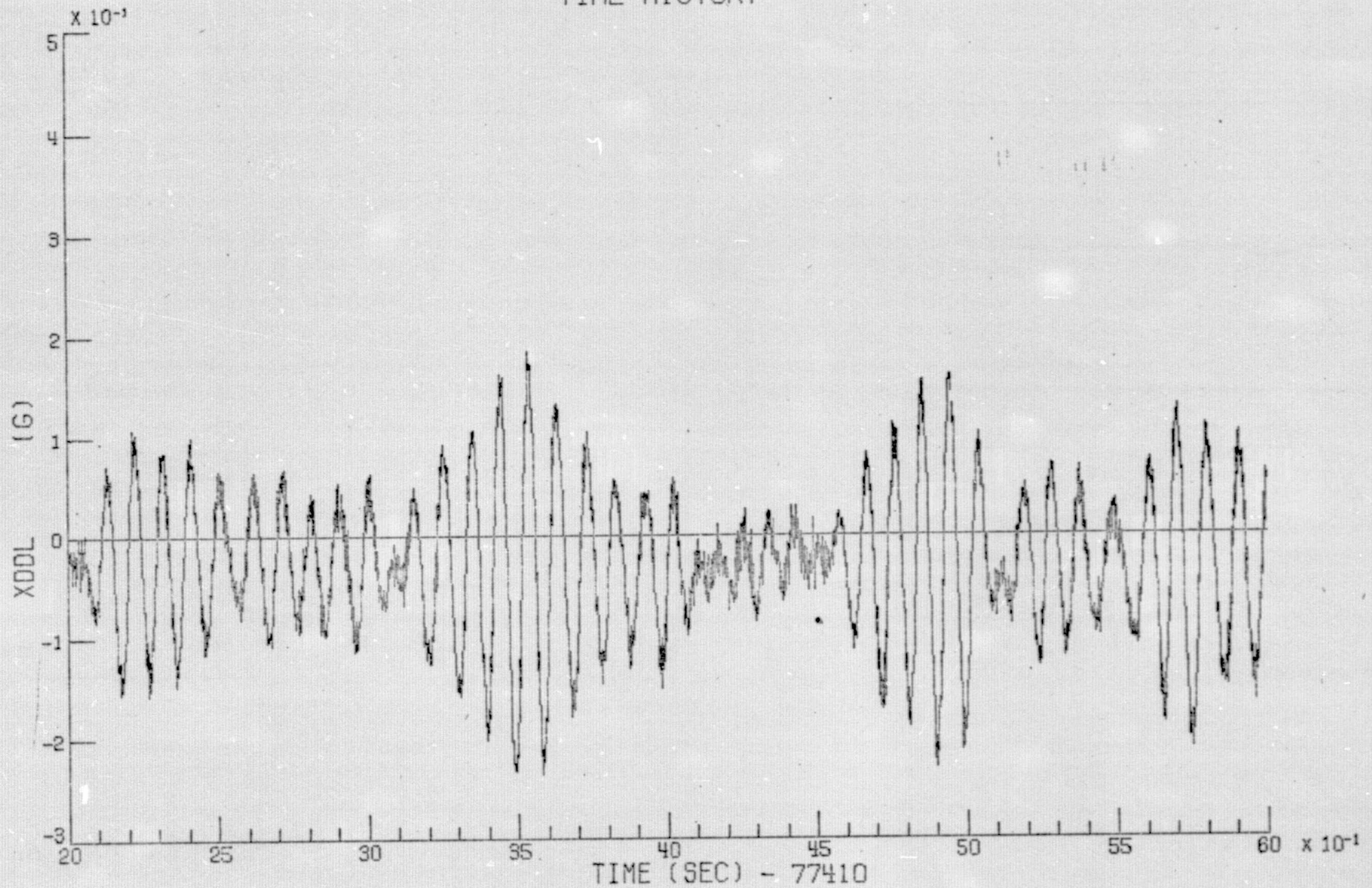
VIKING A FLT (GBI)

CENT BURN 1-1.4

CY1850

TIME HISTORY

2.78



MAX = .183

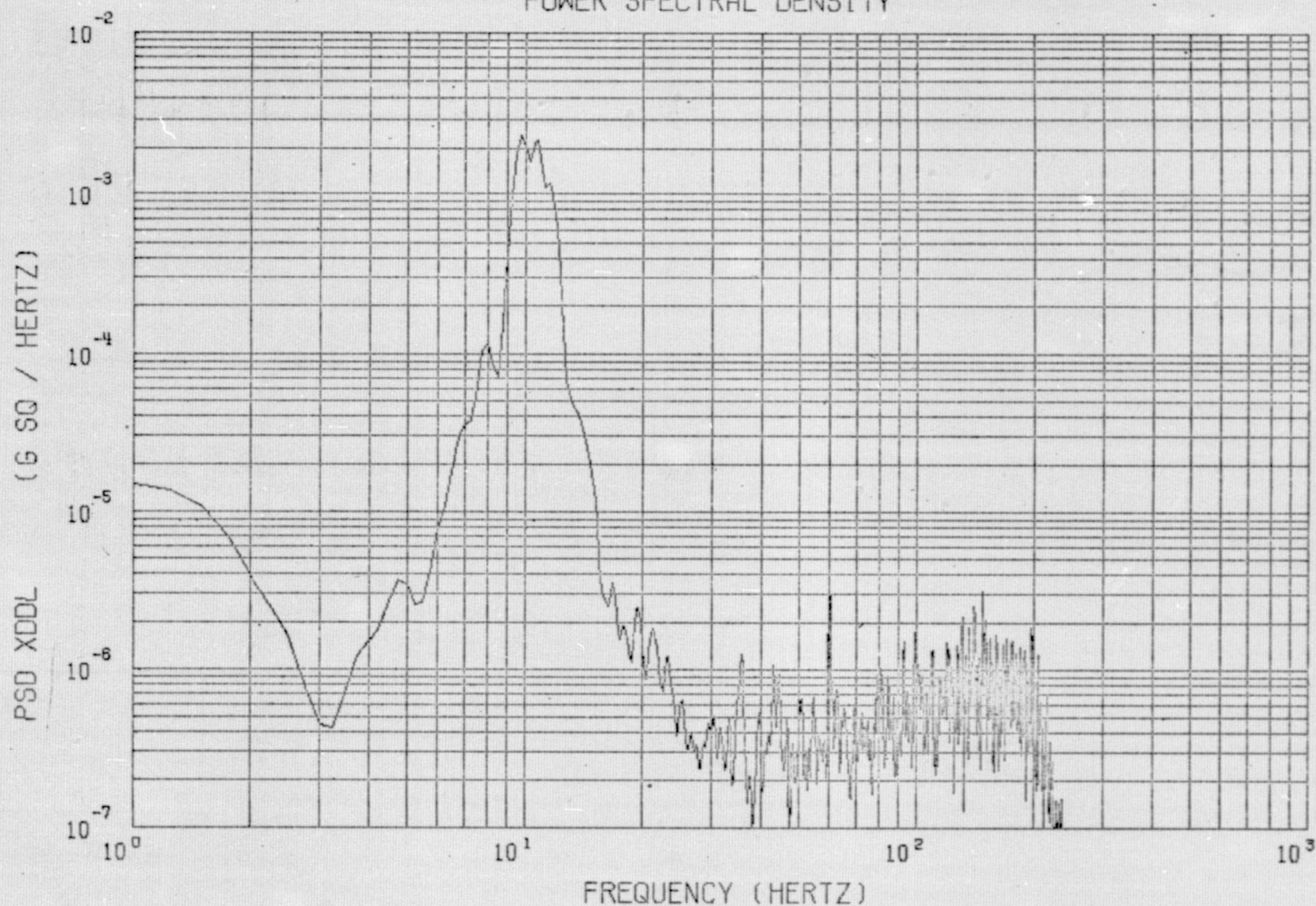
MIN = -.235 → .209

VIKING A FLT (GBI)

CENT BURN 1-1.4

XDDL

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -28711×10^{-8}

$\sigma^2 = 53259 \times 10^{-7}$

$\sigma = 72978 \times 10^{-8}$

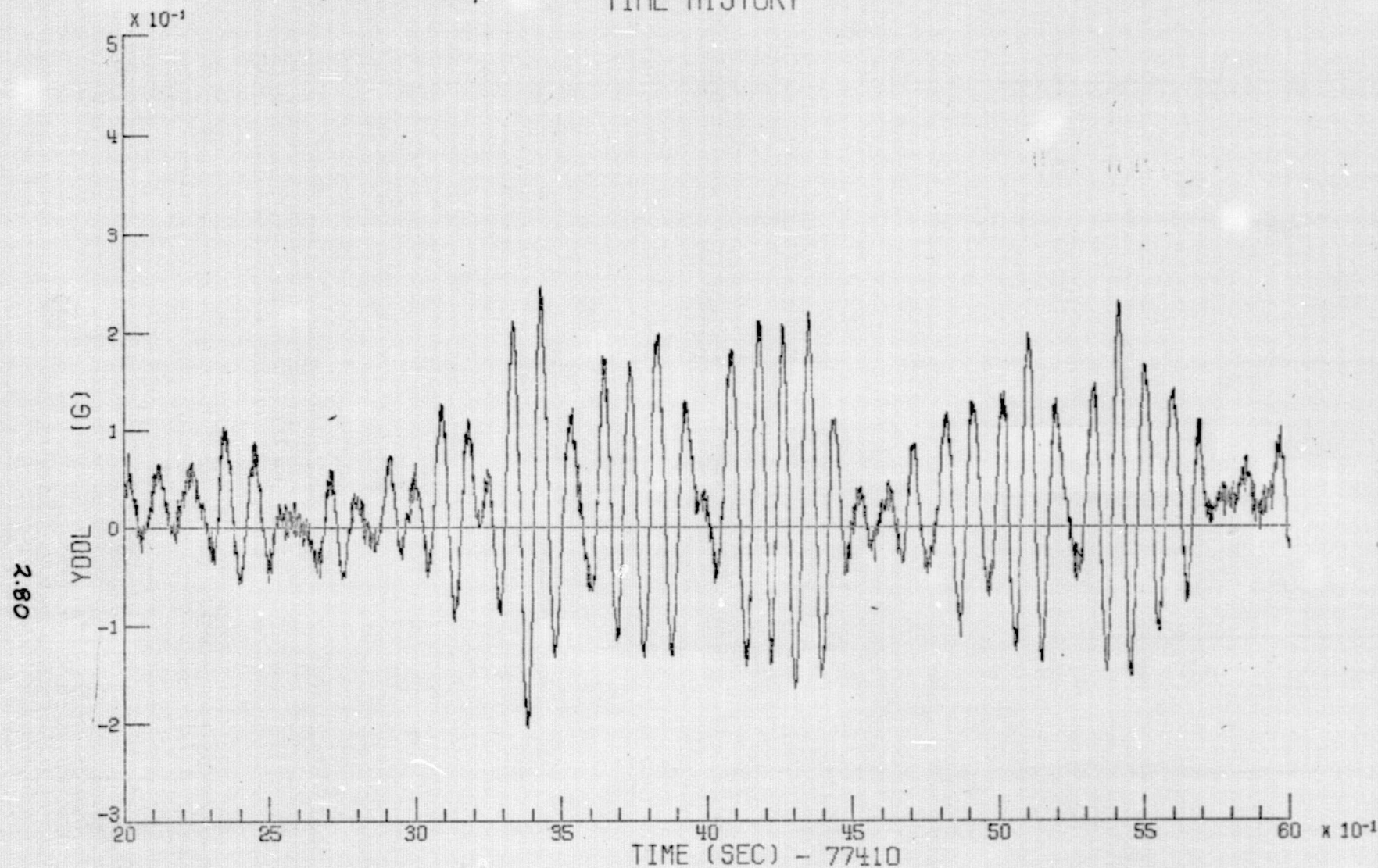
$3\sigma = 21893 \times 10^{-8}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

XDDL

TIME HISTORY



MAX = .245

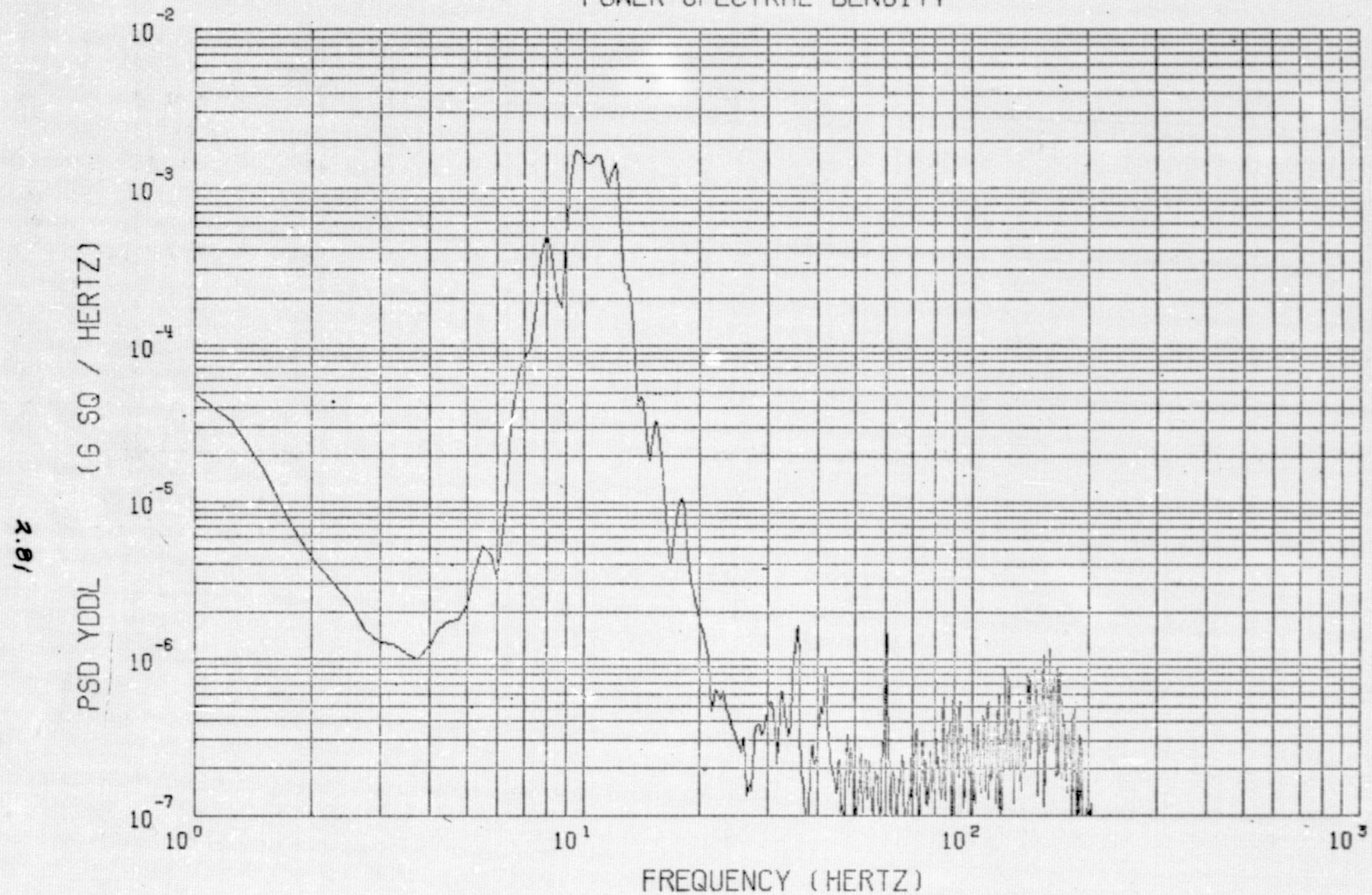
MIN = -.204 → ± .225 g.

VIKING A FLT (GBI)

CENT BURN 1-1.4

YDDL

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = 2178×10^{-5}

$\sigma^2 = 56849 \times 10^{-7}$

$\sigma = 75398 \times 10^{-5}$

$3\sigma = 22619 \times 10^{-5}$

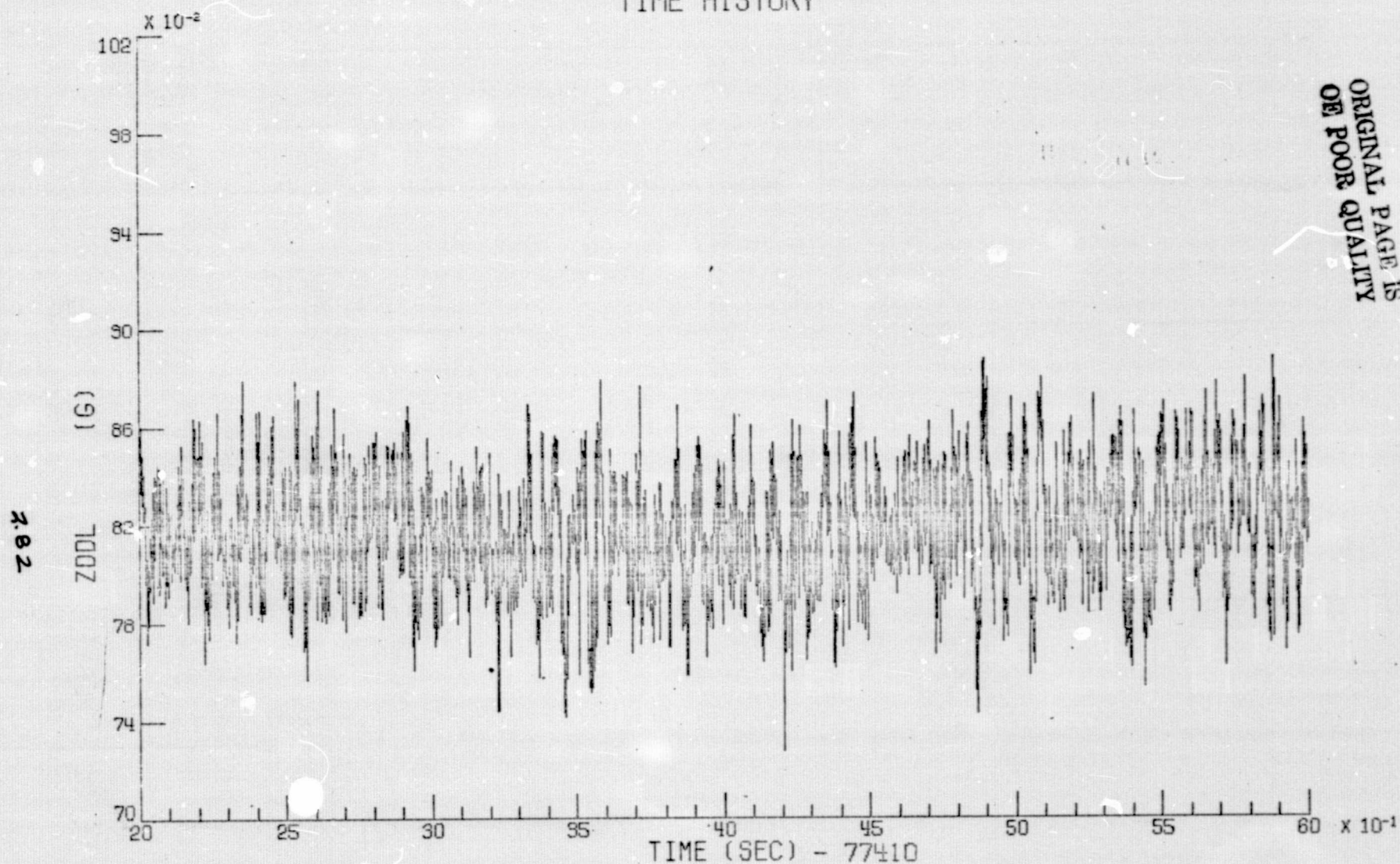
VIKING A FLT (GBI)

CENT BURN 1-1.4

YDDL

TIME HISTORY

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OF POOR QUALITY



MAX = .887

MIN = .727 \rightarrow 1.080

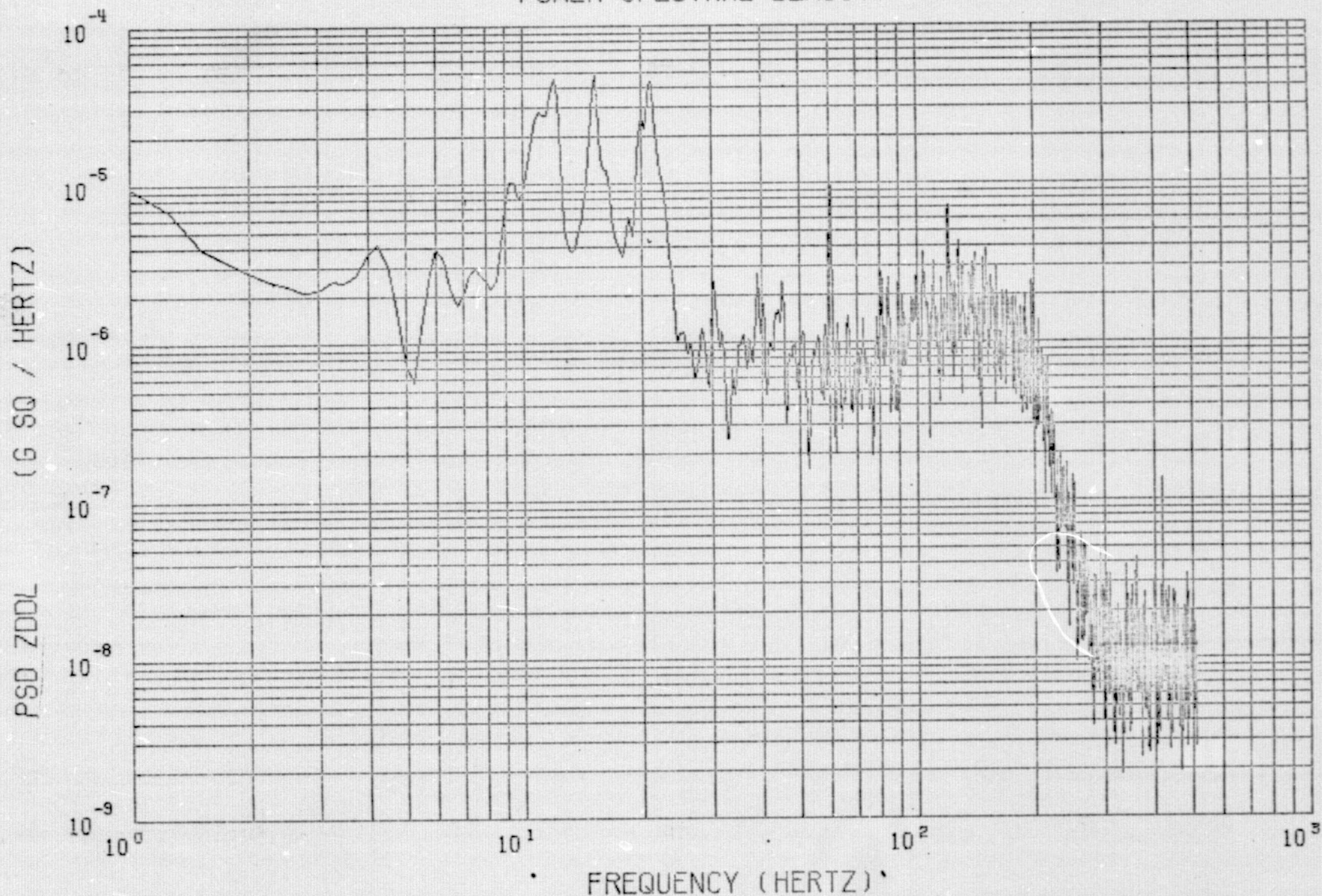
VIKING A FLT (GBI)

CENT BURN 1-1.4

ZDDL

POWER SPECTRAL DENSITY

2.83



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = 81714×10^{-6}

$\sigma^2 = 52267 \times 10^{-6}$

$\sigma = 22862 \times 10^{-6}$

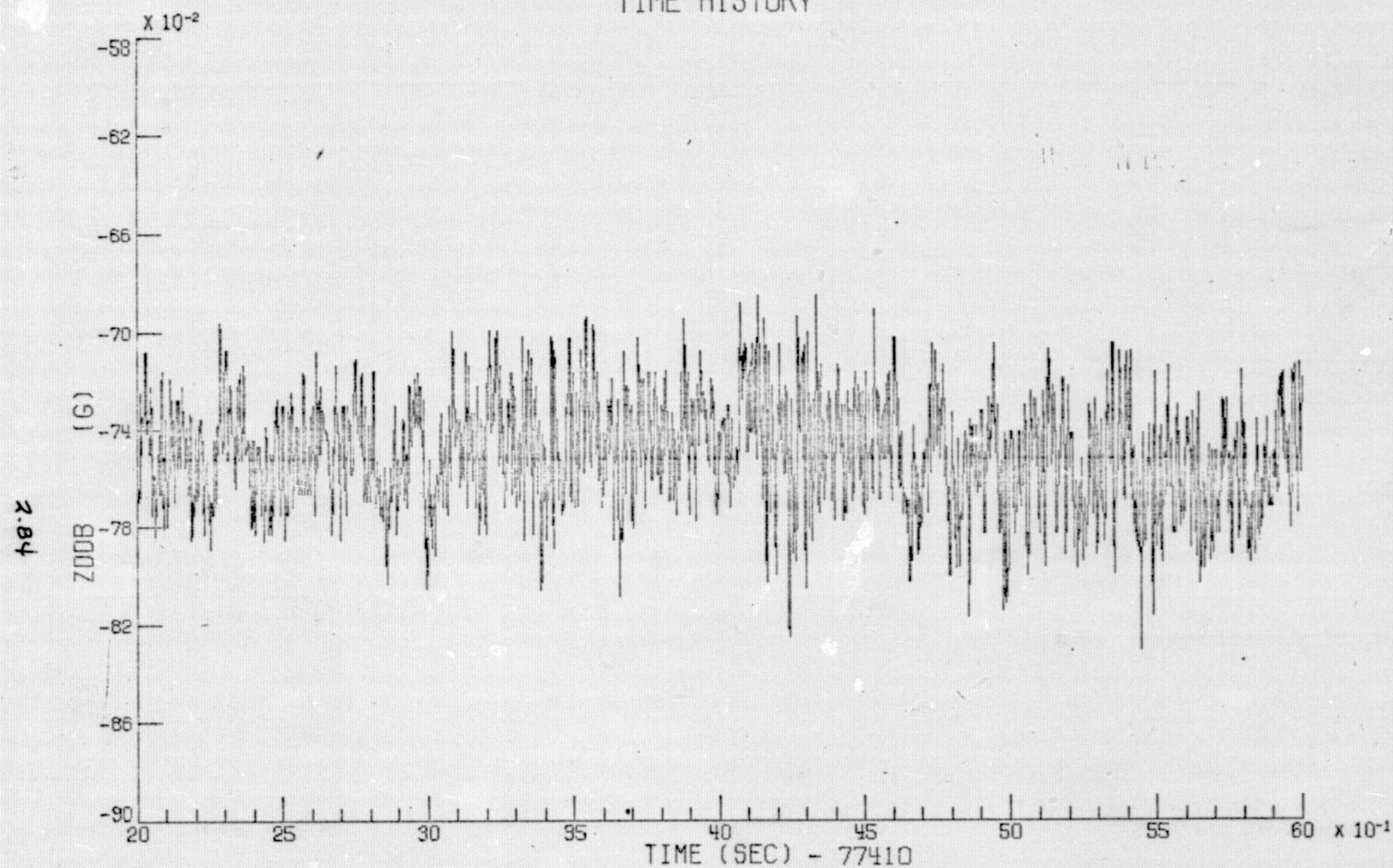
$3\sigma = 68586 \times 10^{-6}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

ZDDL

TIME HISTORY



MAX = -.685

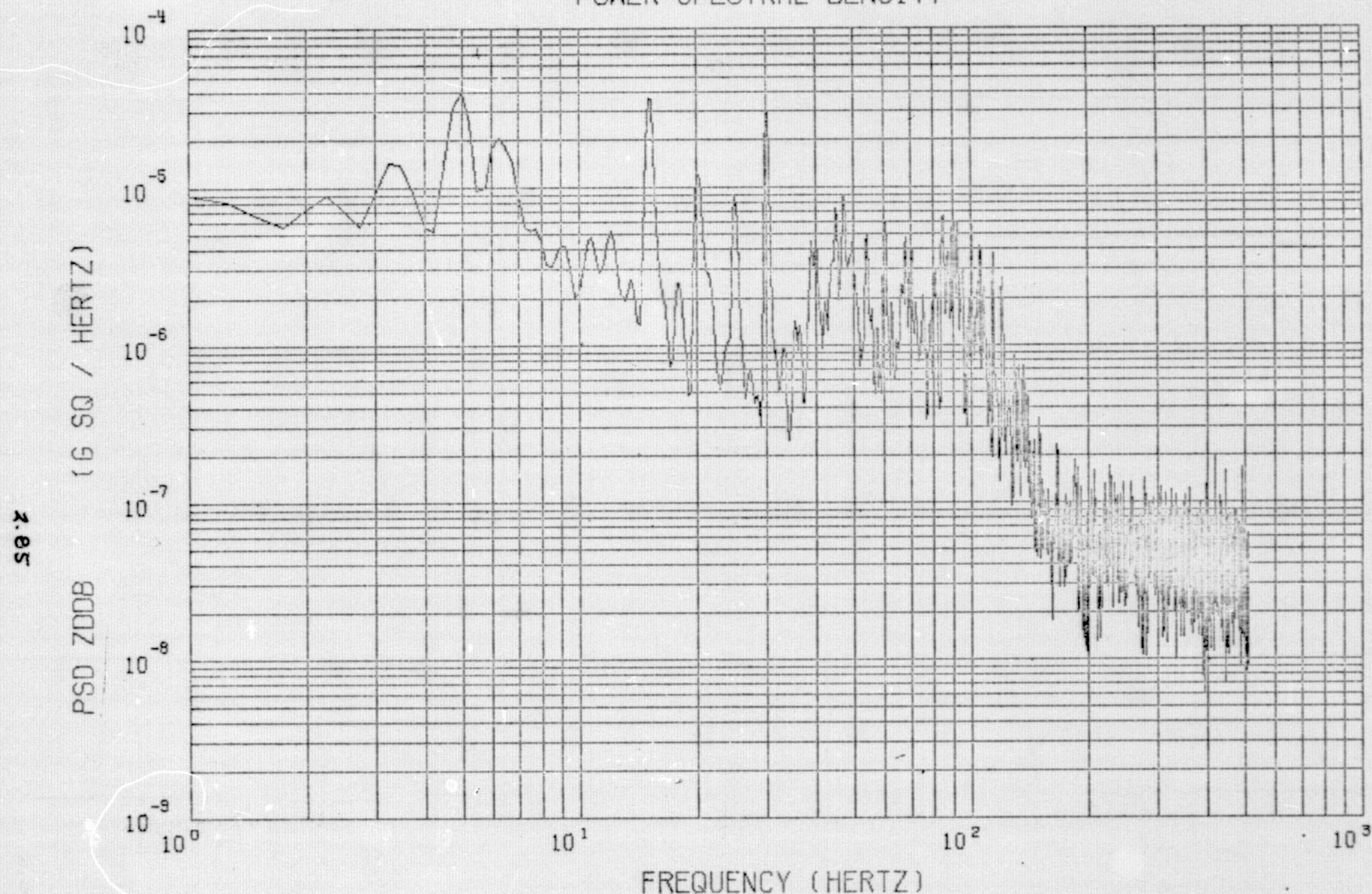
MIN = -.830

VIKING A FLT (GBI)

CENT BURN 1-1.4

ZODB

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -75006×10^{-5}

$\sigma^2 = 43247 \times 10^{-6}$

$\sigma = 20796 \times 10^{-6}$

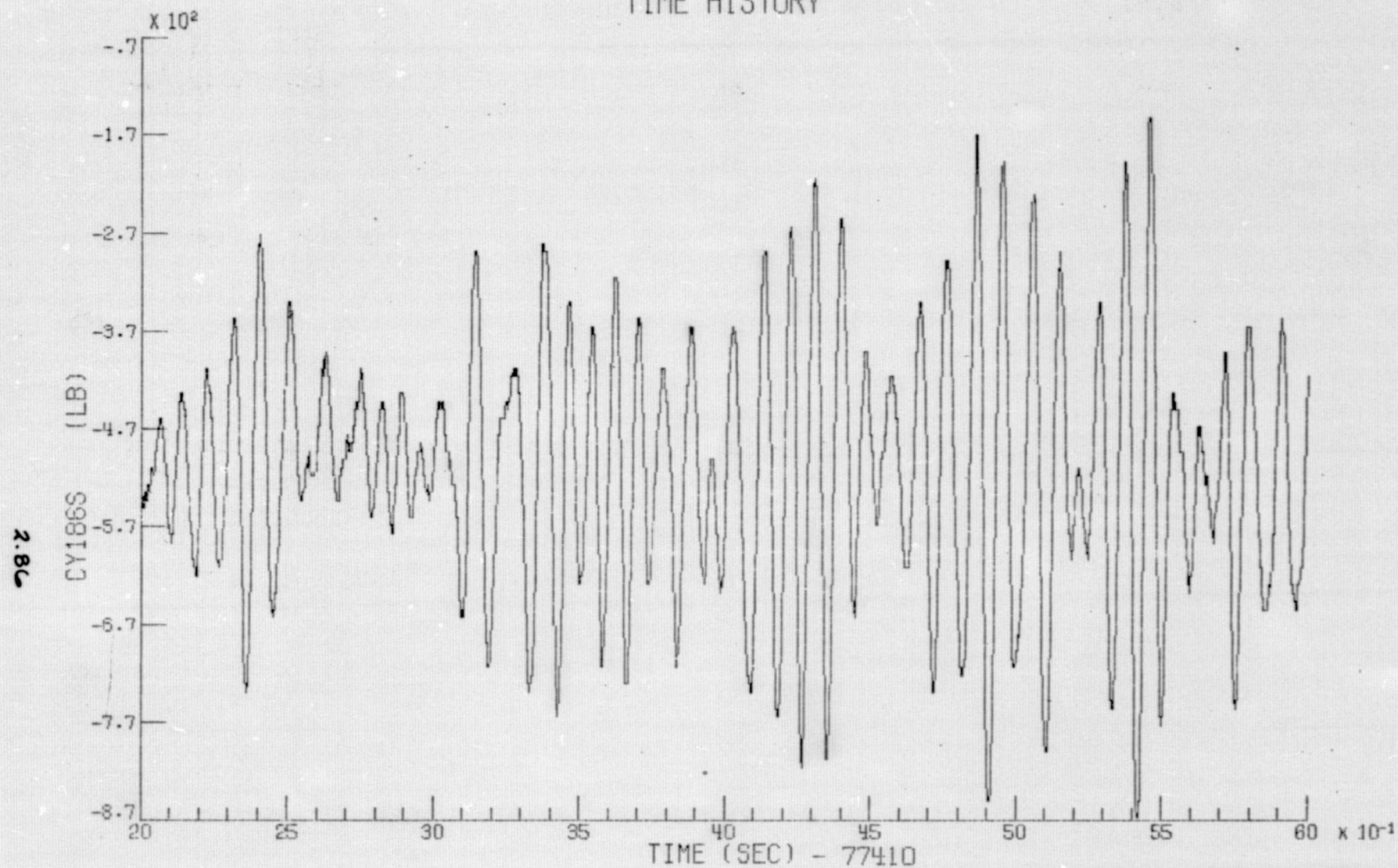
$3\sigma = 62388 \times 10^{-6}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

ZDOB

TIME HISTORY



MAX = -152.964

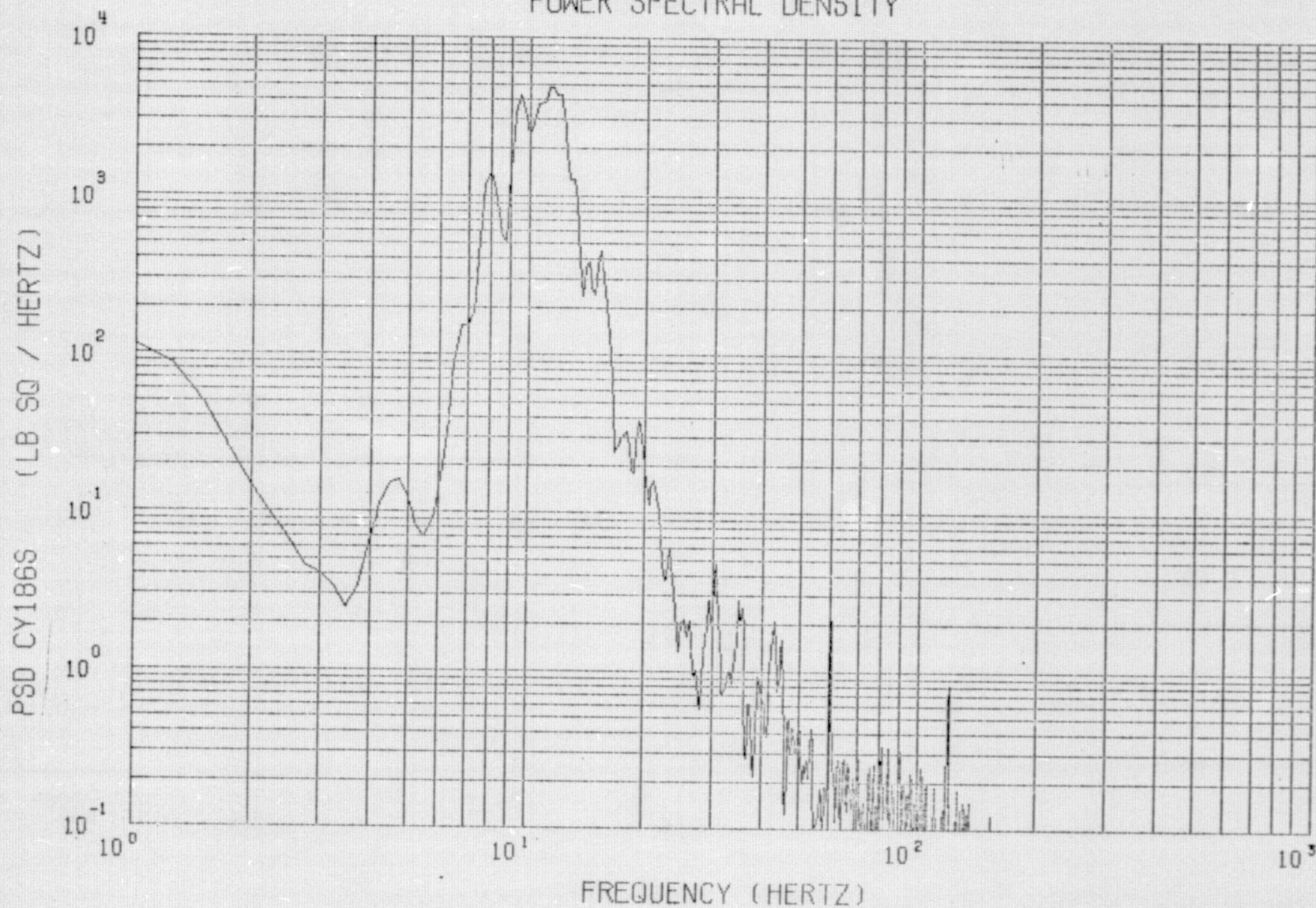
MIN = -866.488

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY186S

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -51226×10^{-2}

$\sigma^2 = 16861 \times 10^0$

$\sigma = 12985 \times 10^{-2}$

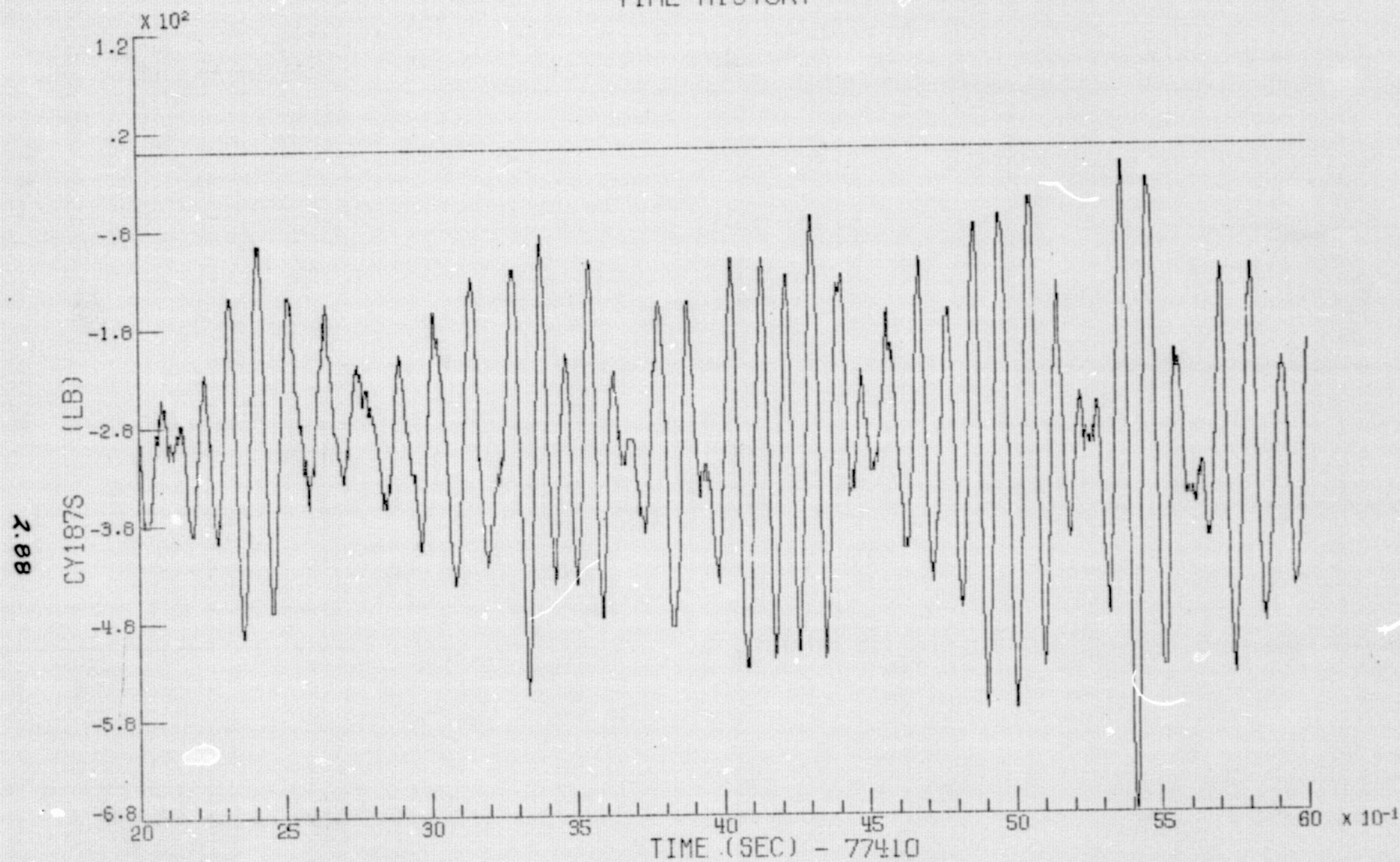
$3\sigma = 38955 \times 10^{-2}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY186S

TIME HISTORY



MAX = -17.105

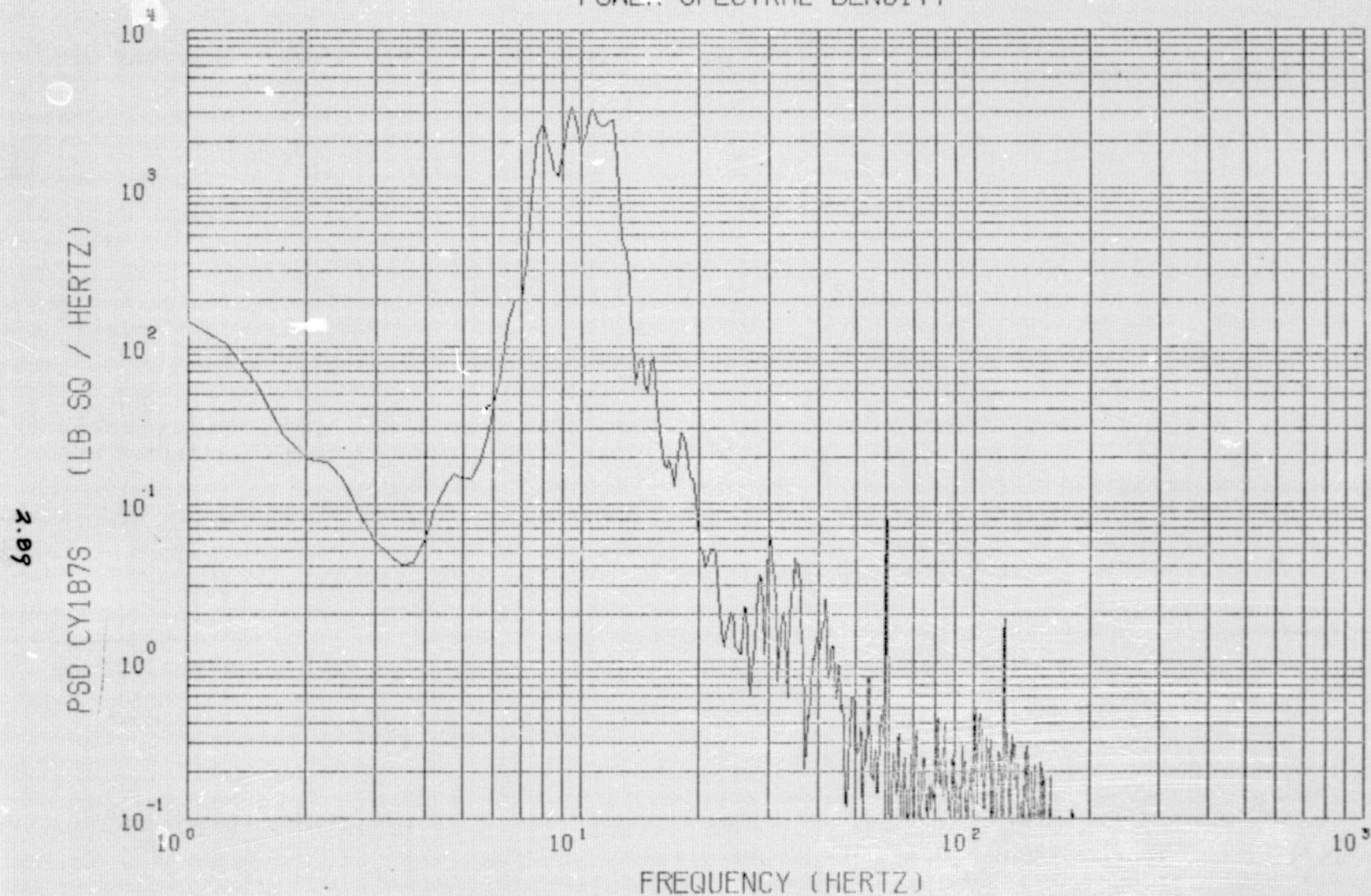
MIN = -676.982

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY187S

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -30379×10^{-2}

$\sigma^2 = 12736 \times 10^0$

$\sigma = 11285 \times 10^{-2}$

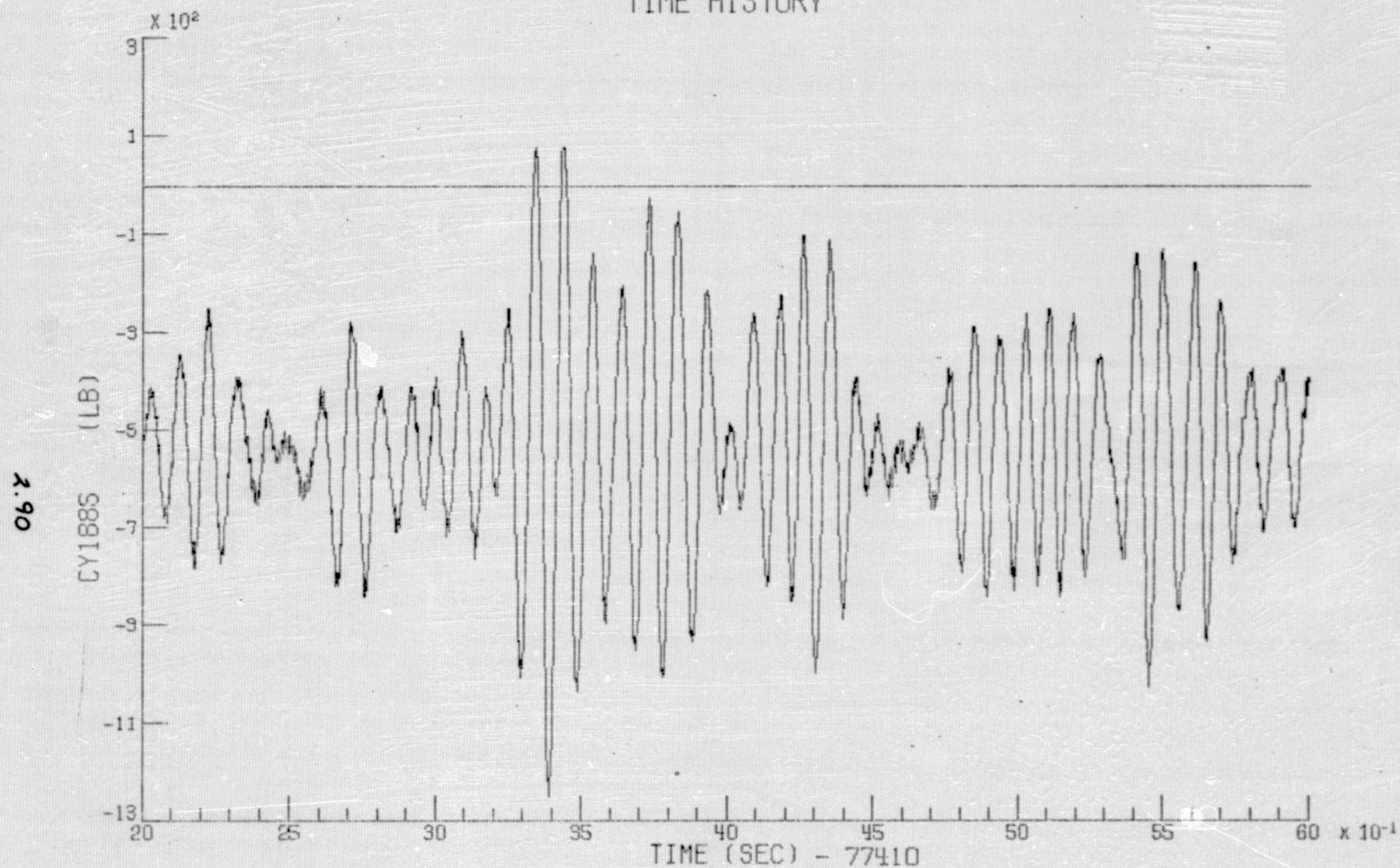
$3\sigma = 33857 \times 10^{-2}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY187S

TIME HISTORY



MAX = 75.600

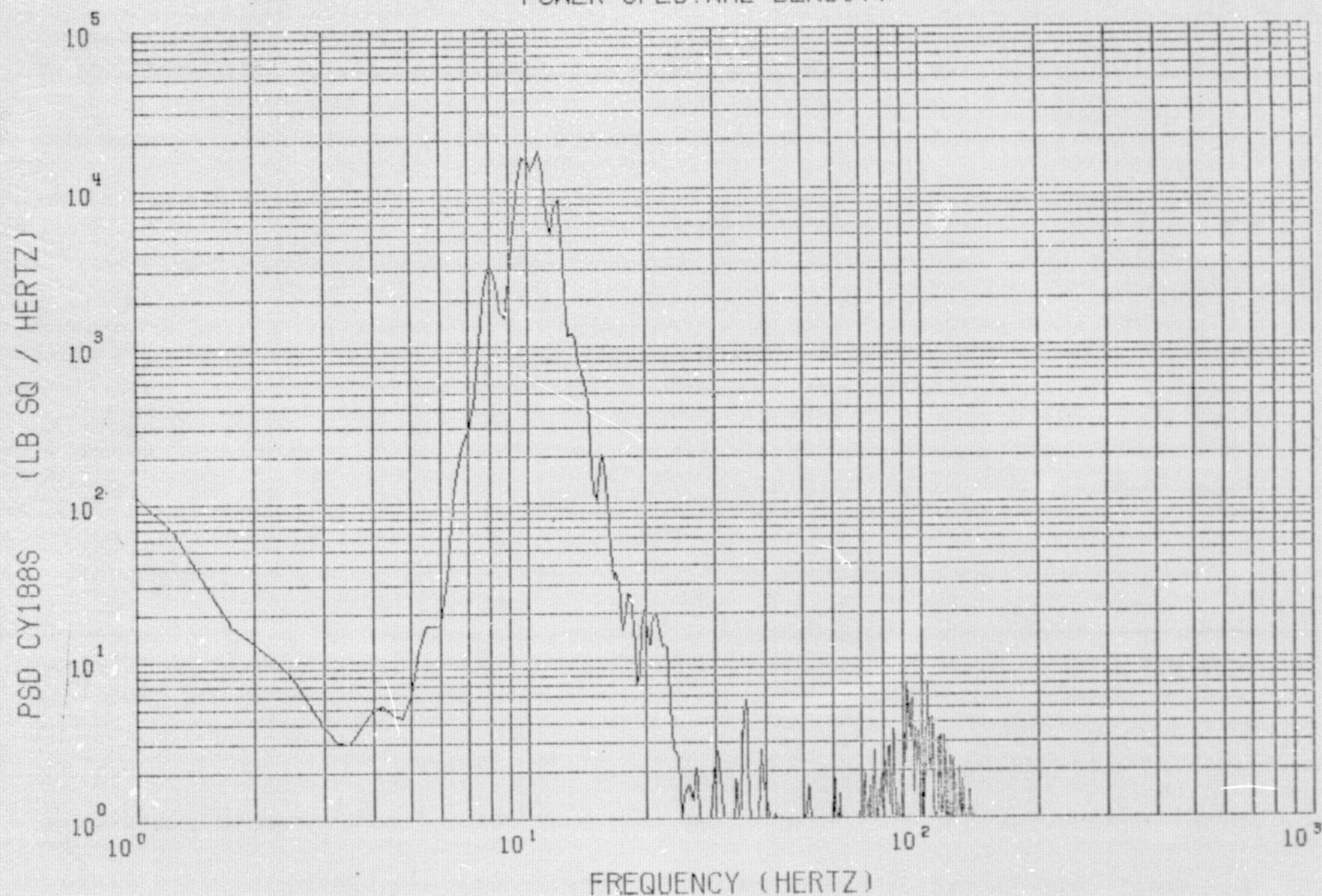
MIN = -1251.179

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY188S

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -53577×10^{-2}

$\sigma^2 = 41584 \times 10^0$

$\sigma = 20392 \times 10^{-2}$

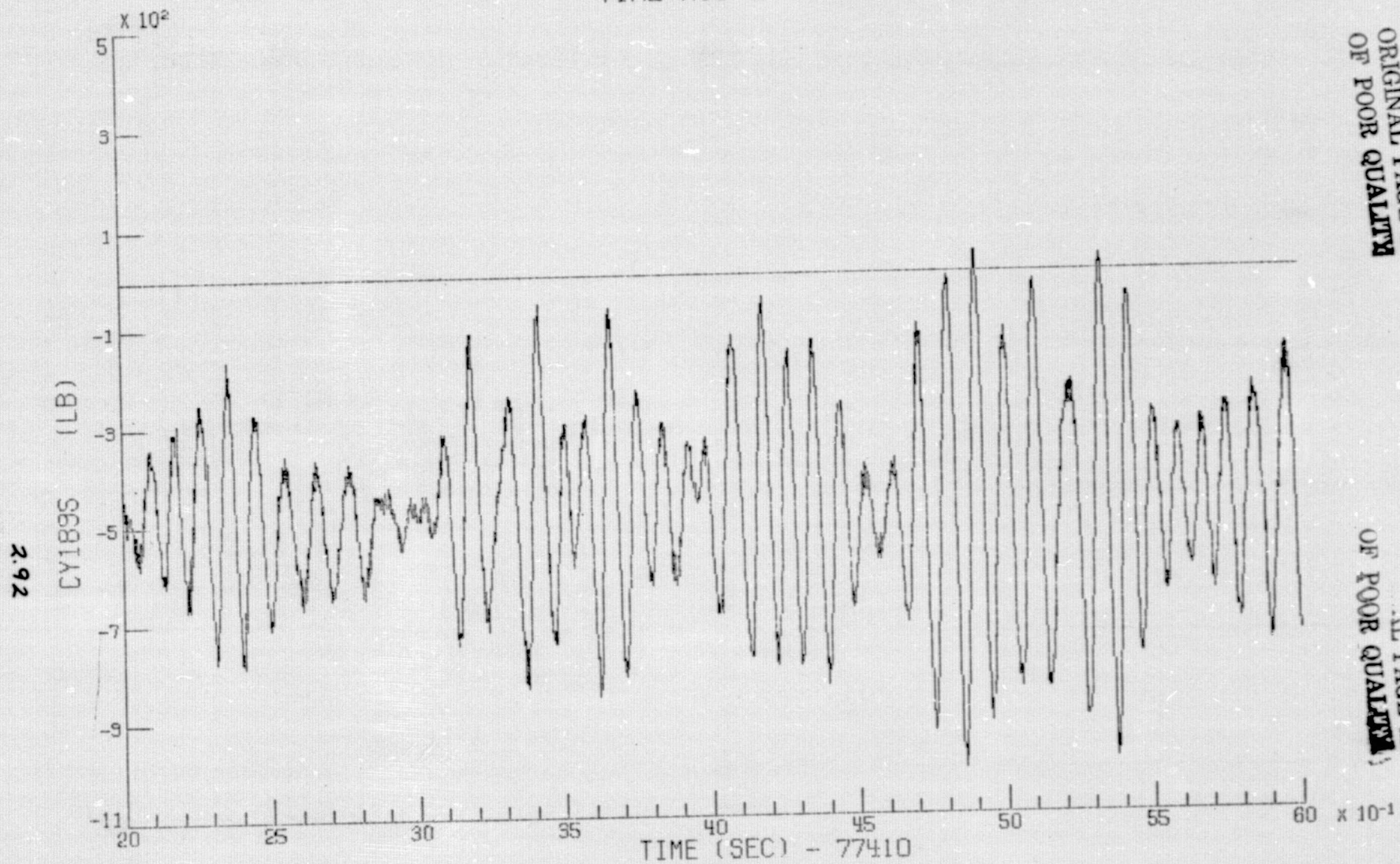
$3\sigma = 61176 \times 10^{-2}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY188S

TIME HISTORY



MAX = 33-136

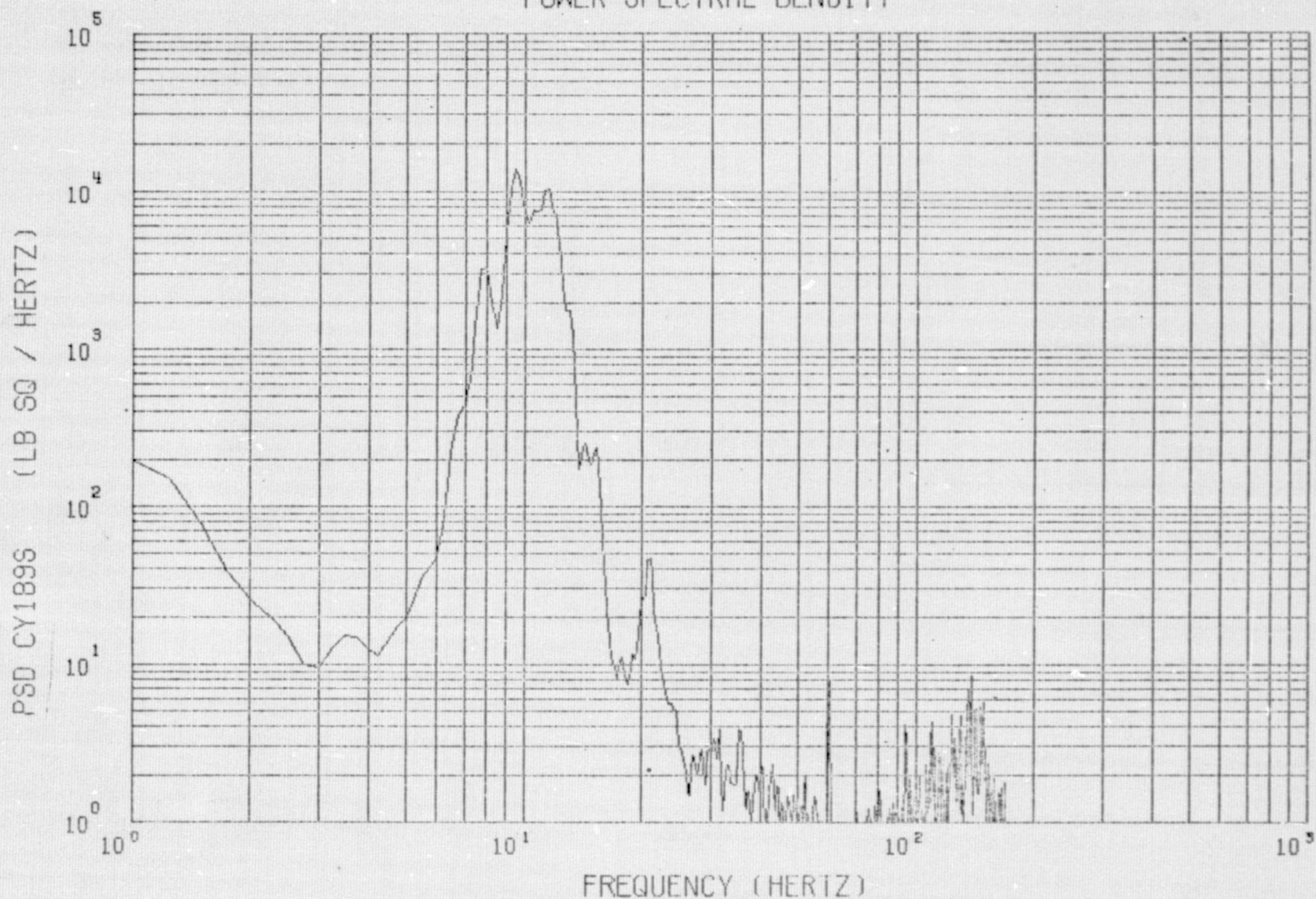
MIN = -1008-812

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY189S

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -47518×10^{-2}

$\sigma^2 = 36722 \times 10^0$

$\sigma = 19163 \times 10^{-2}$

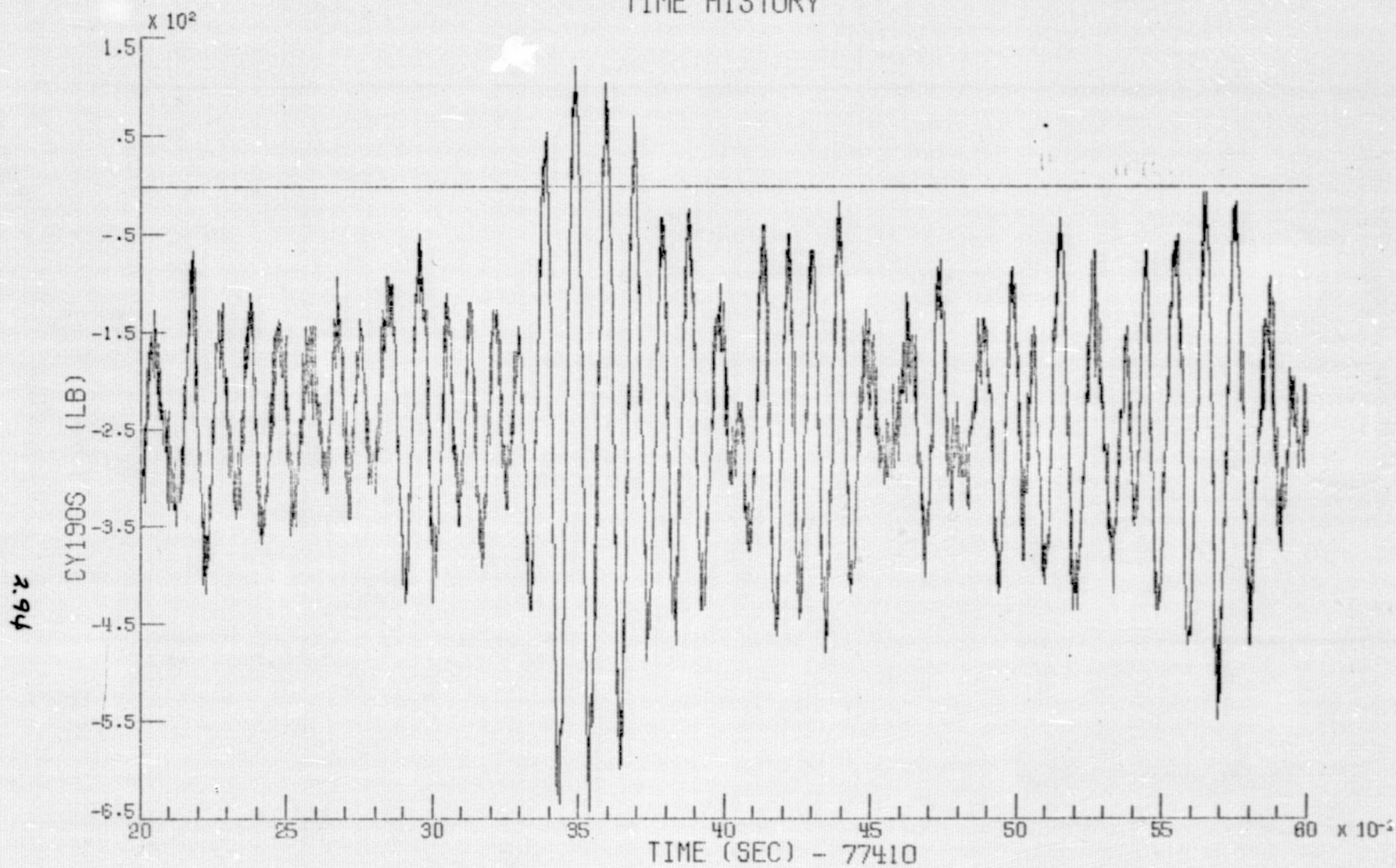
$3\sigma = 57489 \times 10^{-2}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY189S

TIME HISTORY



MAX = 122.026

MIN = -642.691

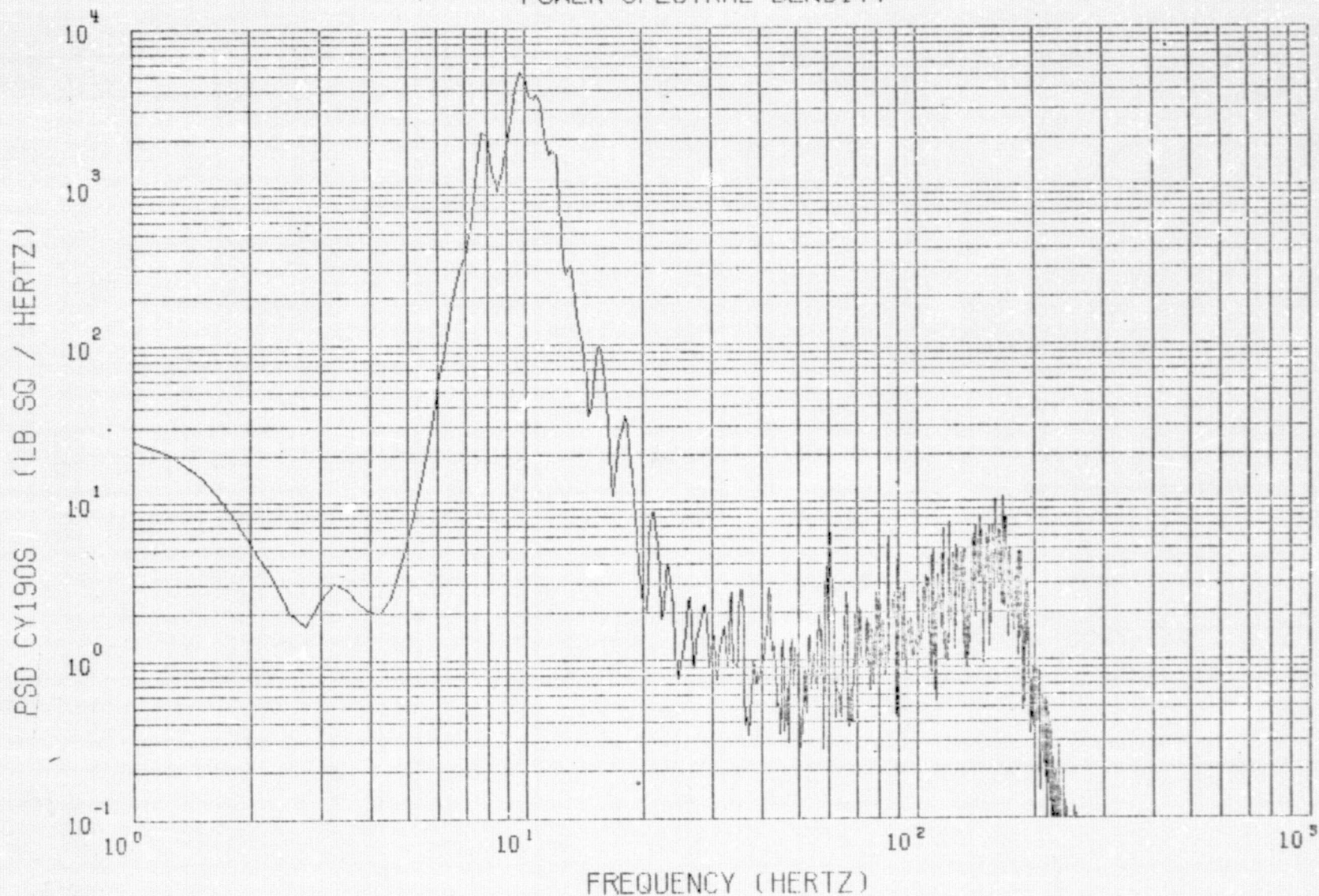
VIKING A FLT (GBI)

CENT BURN 1-1.4

CY190S

POWER SPECTRAL DENSITY

8.95



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -24317×10^{-2}

$\sigma^2 = 13857 \times 10^0$

$\sigma = 11771 \times 10^{-2}$

$3\sigma = 35315 \times 10^{-2}$

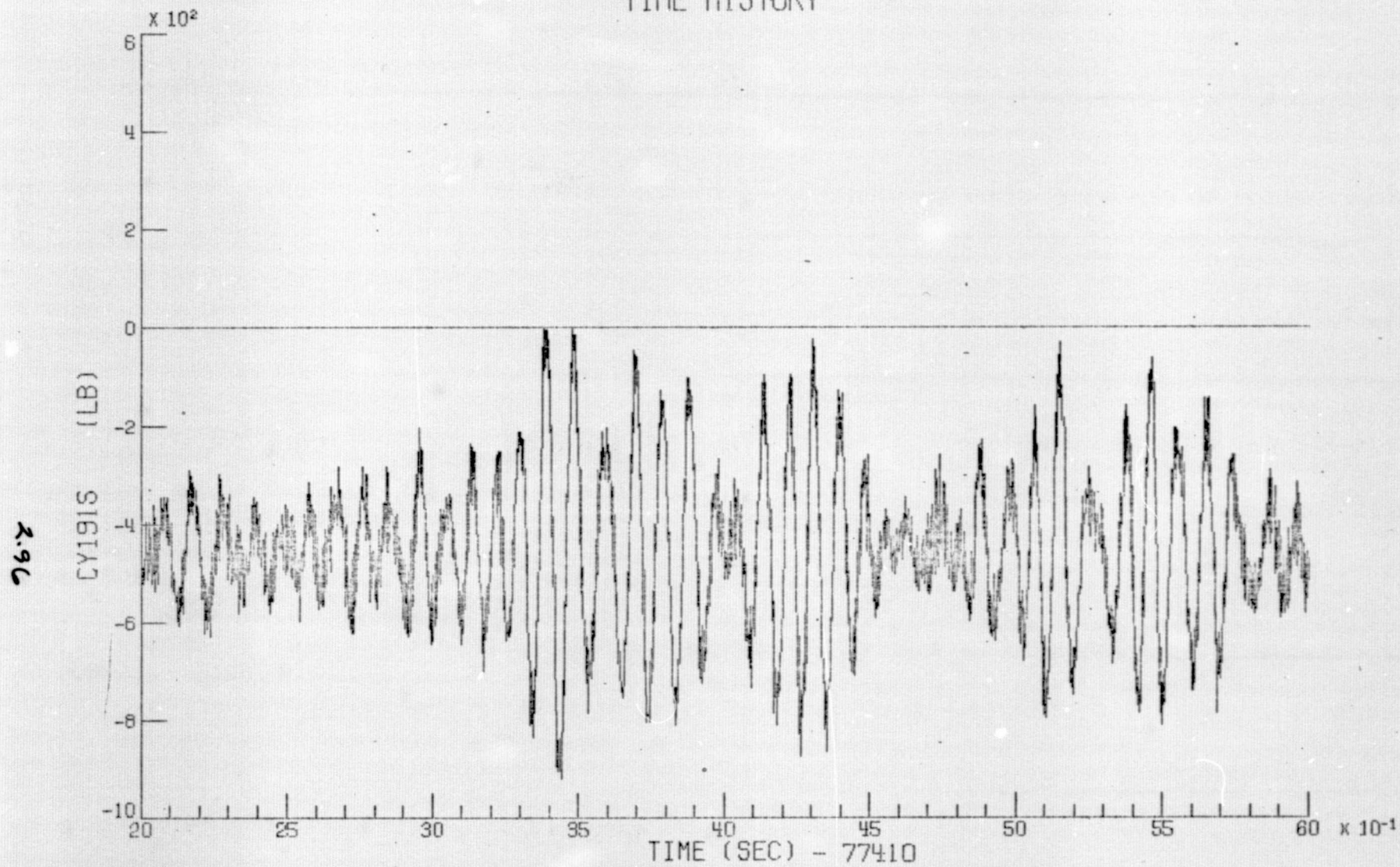
VIKING A FLT (GB1)

CENT BURN 1-1.4

CY190S

C-2

TIME HISTORY



MAX = .436

MIN = -919.694

VIKING A FLT (GB1)

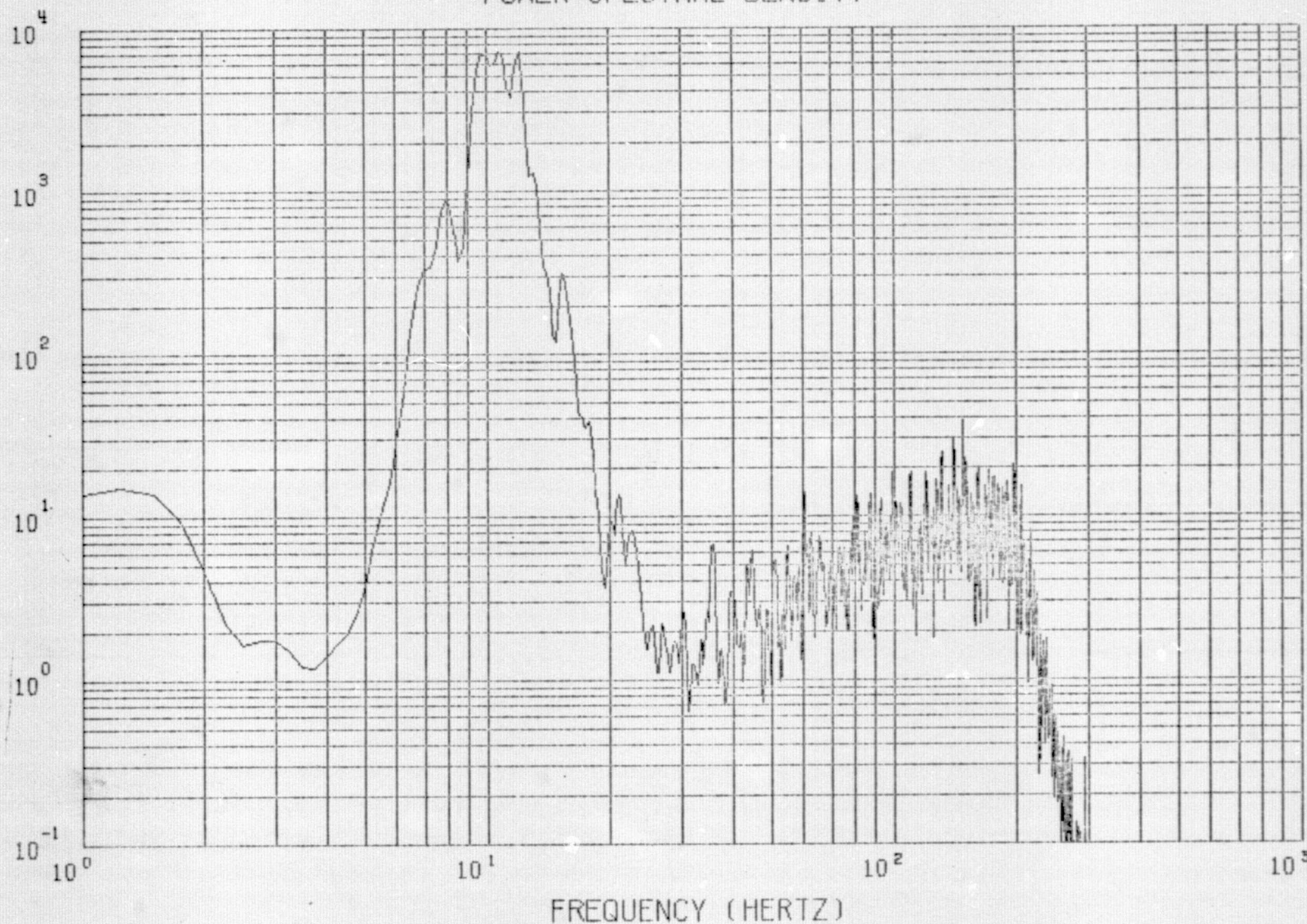
CENT BURN 1-1.4

CY191S

POWER SPECTRAL DENSITY

2.97

PSD CY191S (LB SQ / HERTZ)



$\Delta F = .250$

START = 77412.000 SEC

STOP = 77416.000 SEC

MEAN = -45084×10^{-2}

$\sigma^2 = 23731 \times 10^0$

$\sigma = 15405 \times 10^{-2}$

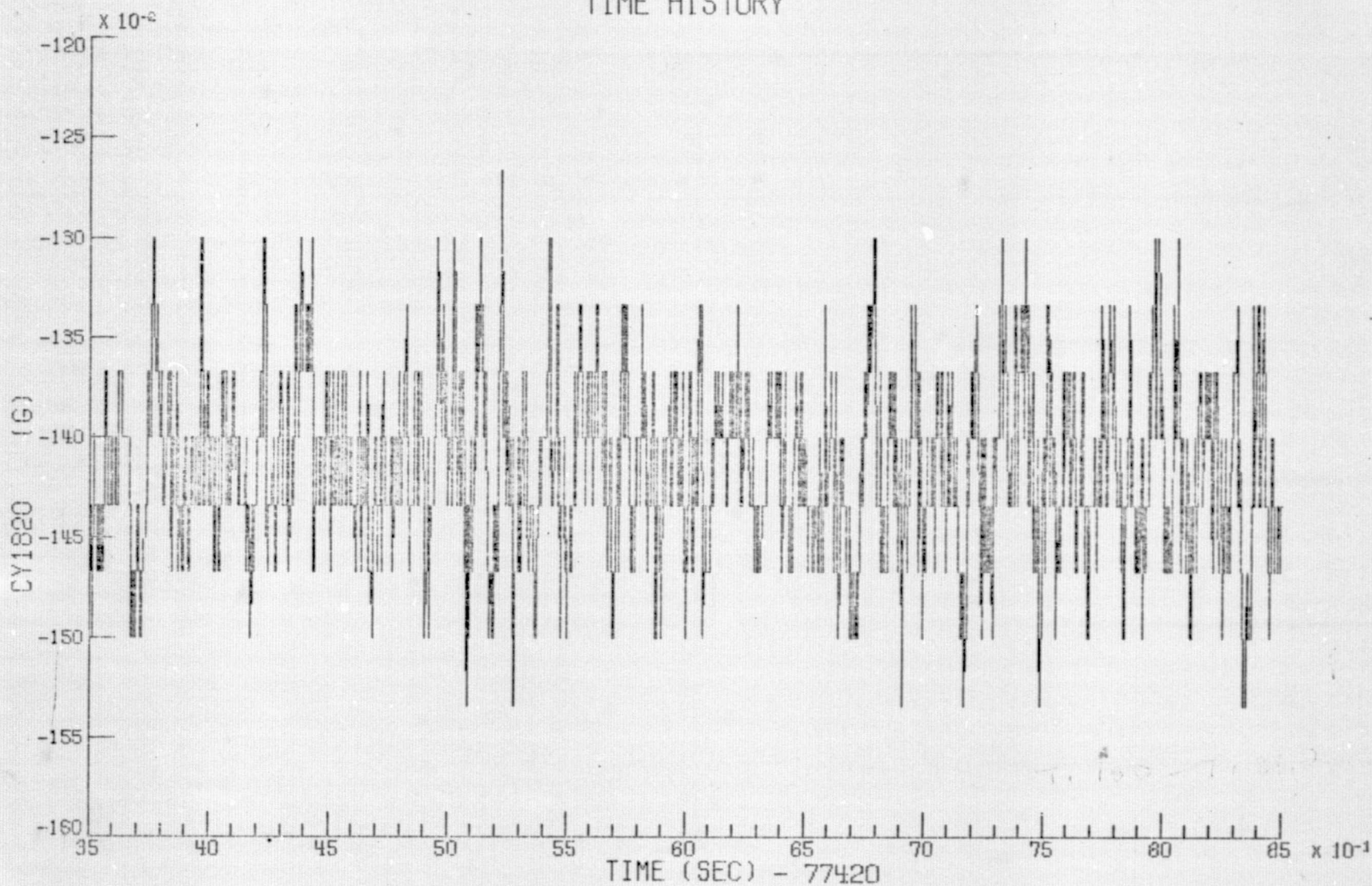
$3\sigma = 46215 \times 10^{-2}$

VIKING A FLT (GBI)

CENT BURN 1-1.4

CY191S

TIME HISTORY



MAX = -1.266

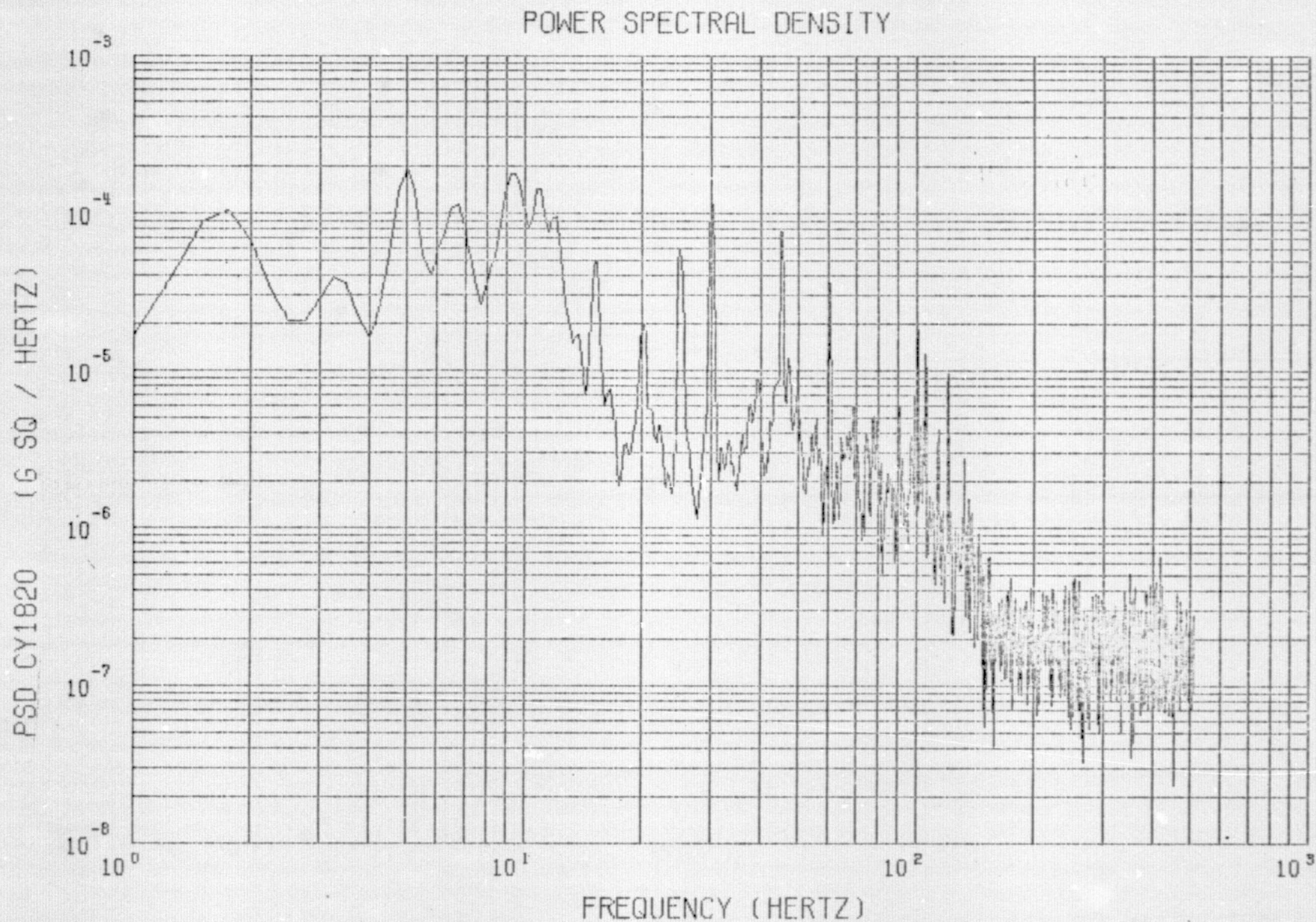
MIN = -1.533

VIKING A FLT (GBI)

CENT BURN 1-2.4

CY1820

662



$\Delta F = .250$

START = 77423.500 SEC

STOP = 77428.500 SEC

MEAN = -14142×10^{-4}

$\sigma^2 = 16555 \times 10^{-7}$

$\sigma = 40688 \times 10^{-6}$

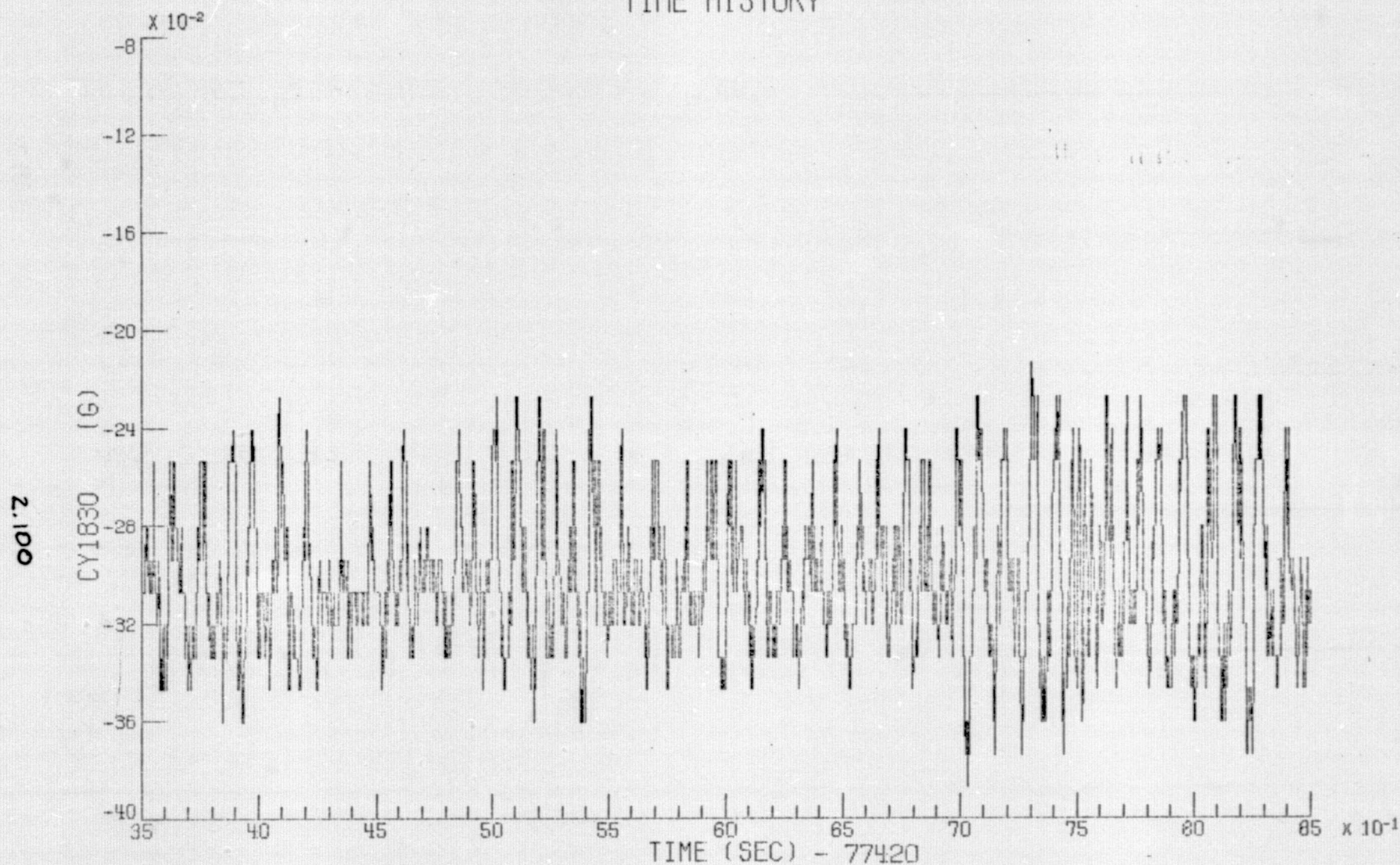
$3\sigma = 12206 \times 10^{-5}$

VIKING A FLT (GBI)

CENT BURN 1-2.4

CY1820

TIME HISTORY



MAX = -.213

MIN = -.387

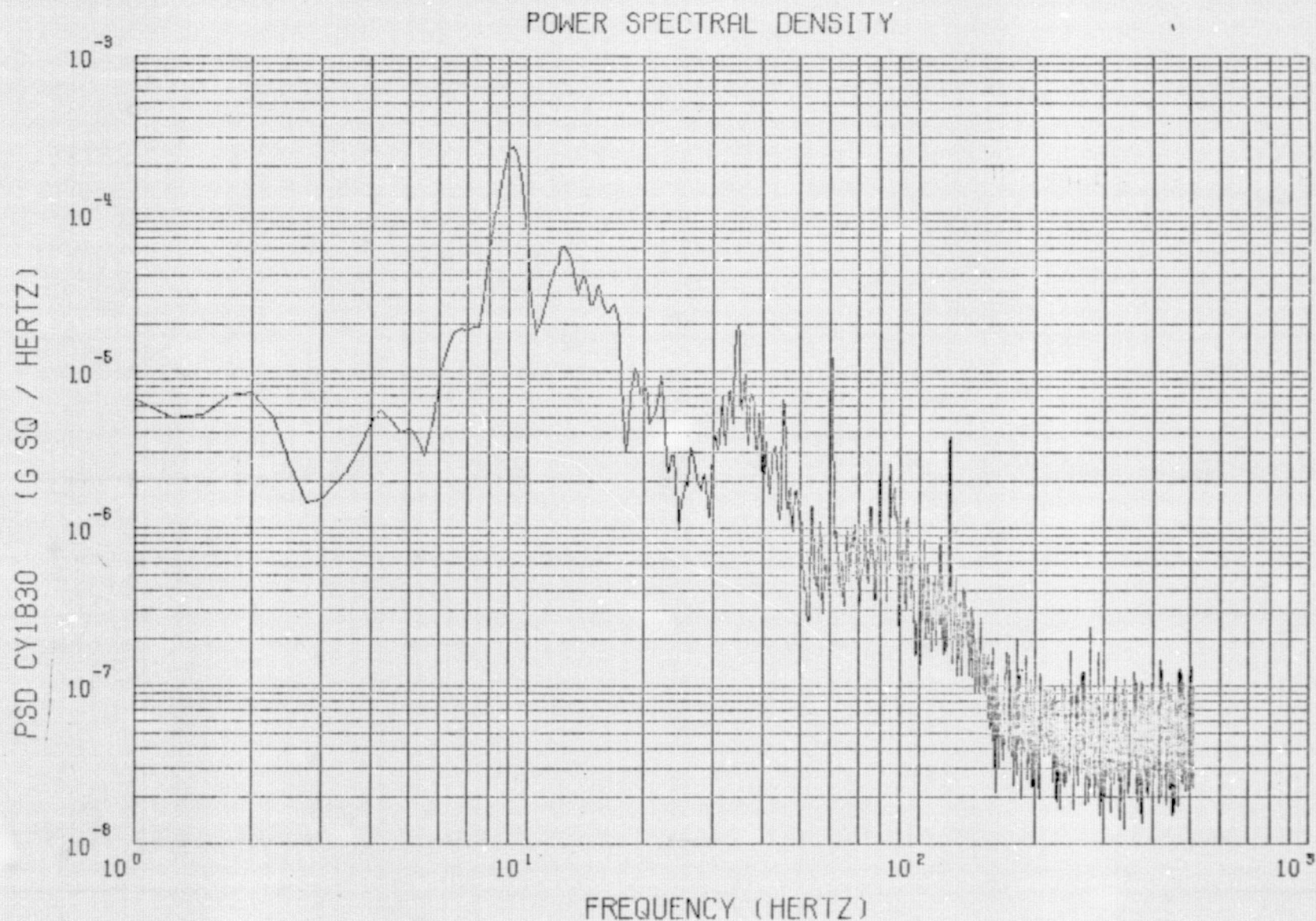
VIKING A FLT (GB1)

CENT BURN 1-2.4

CY1830

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OF POOR QUALITY

2101

 $\Delta F = .250$

START = 77423.500 SEC

STOP = 77428.500 SEC

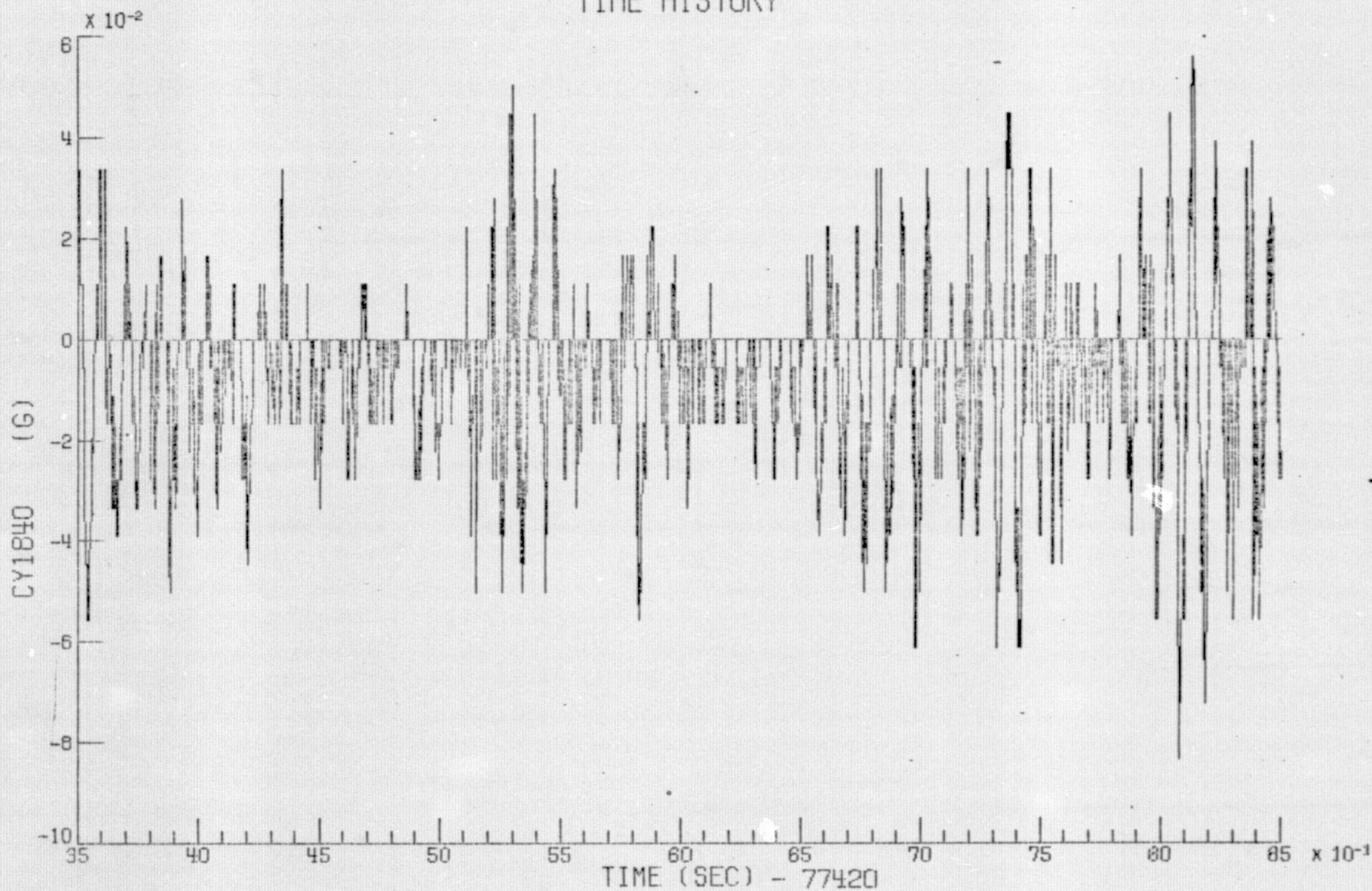
MEAN = -30167×10^{-8} $\sigma^2 = 88947 \times 10^{-8}$ $\sigma = 29824 \times 10^{-6}$ $3\sigma = 89472 \times 10^{-6}$

VIKING A FLT (GBI)

CENT BURN 1-2.4

CY1830

TIME HISTORY



MAX = .055

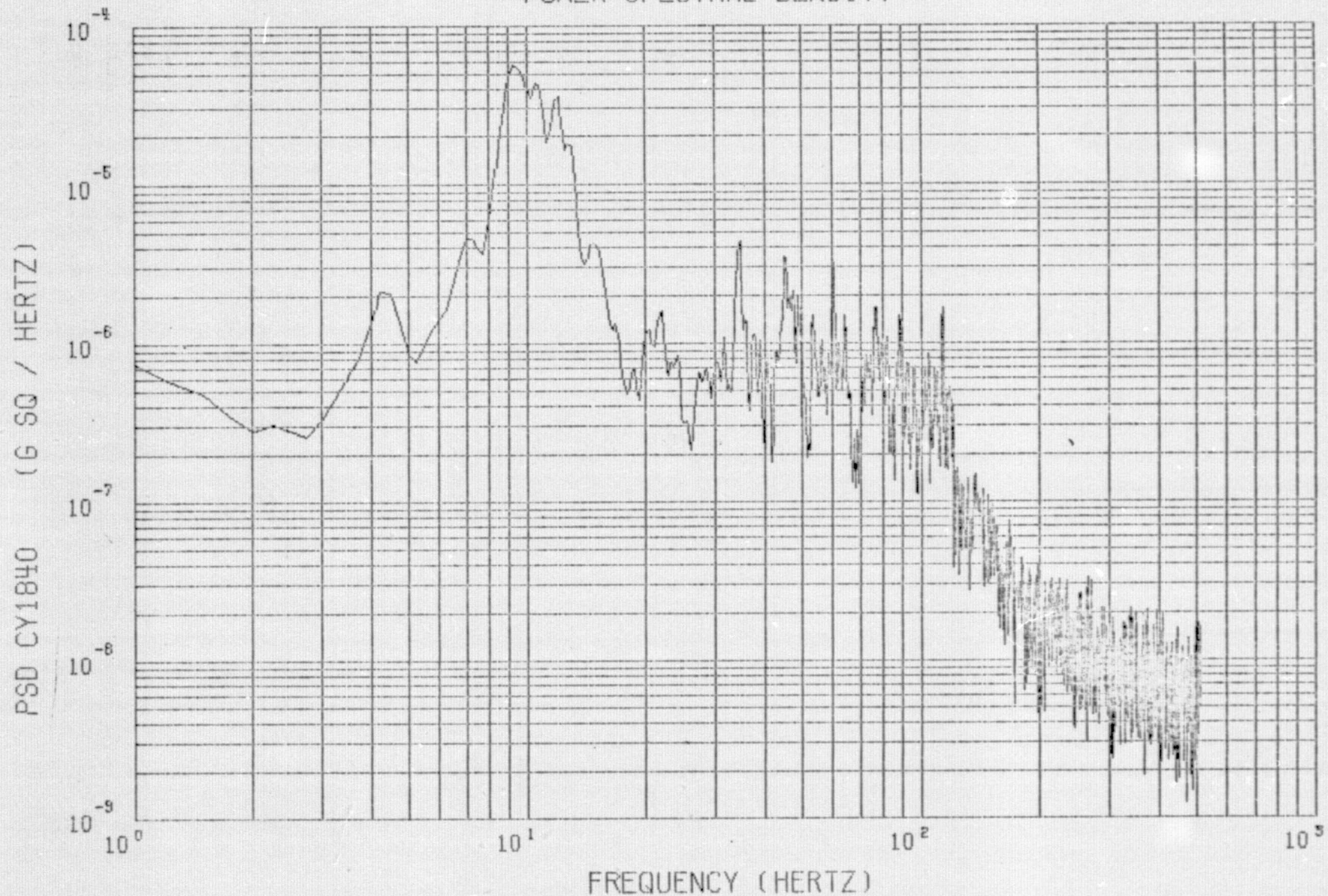
MIN = -.083

VIKING A FLT (GBI)

CENT BURN 1-2.4

CY1840

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77423.500 SEC

STOP = 77428.500 SEC

MEAN = -64917×10^{-7}

$\sigma^2 = 26895 \times 10^{-8}$

$\sigma = 16399 \times 10^{-8}$

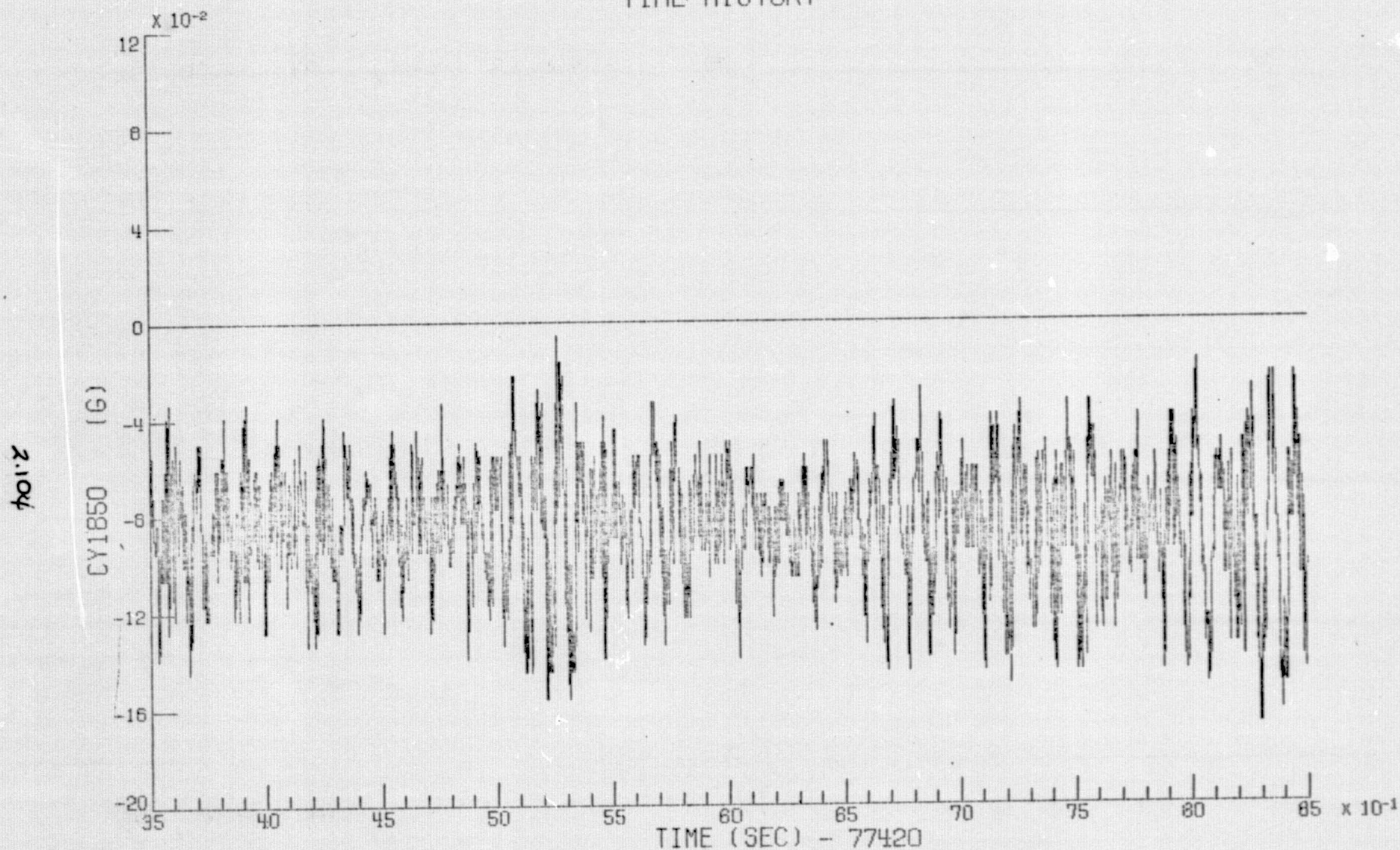
$3\sigma = 49199 \times 10^{-8}$

VIKING A FLT (GBI)

CENT BURN 1-2.4

CY1840

TIME HISTORY



MAX = -.005

MIN = -.166

→ ± .086

VIKING A FLT (GBI)

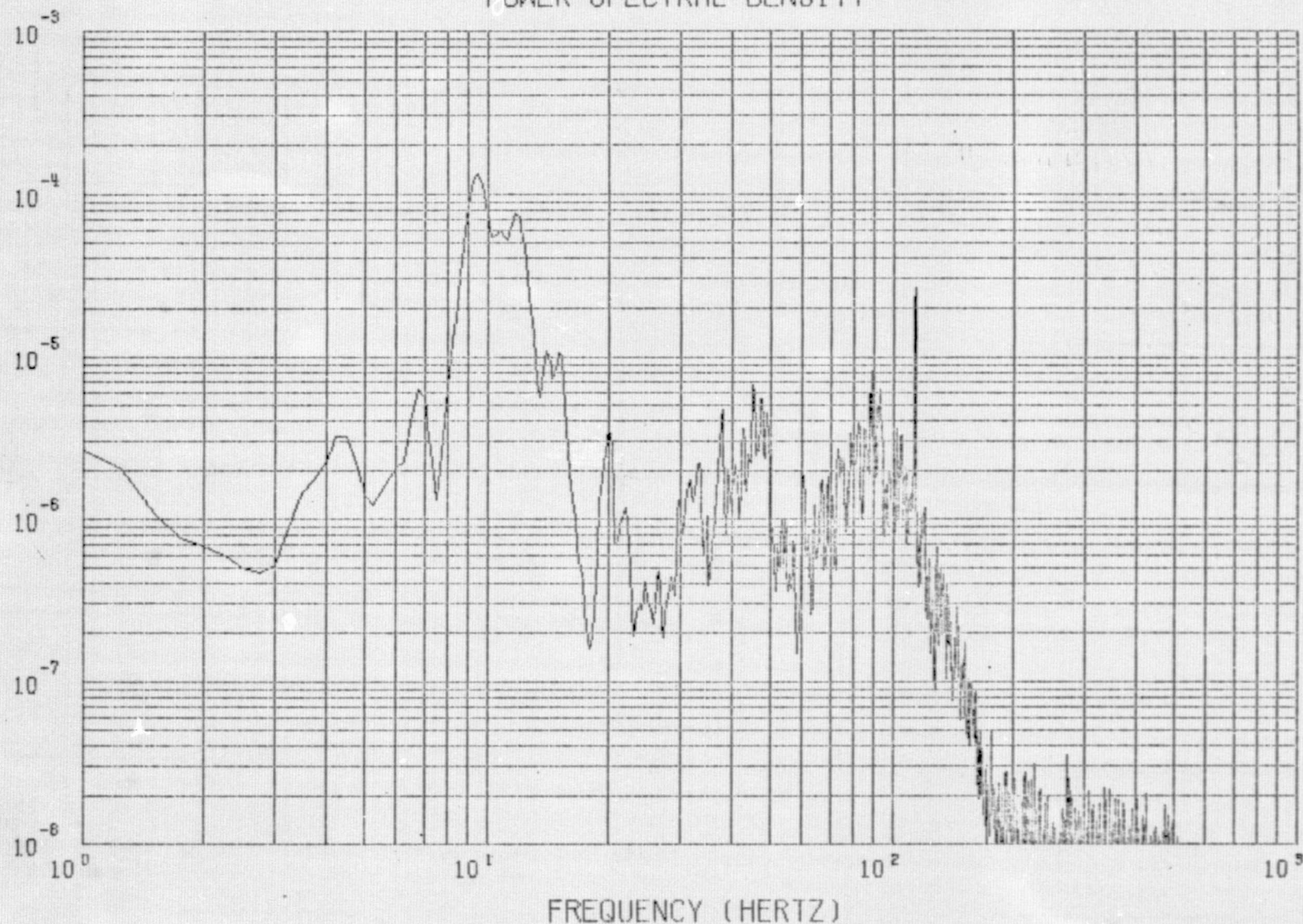
CENT BURN 1-2.4

CY1850

5012

PSD CY1850 (G SQ / HERTZ)

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77423.500 SEC

STOP = 77428.500 SEC

MEAN = -84389×10^{-6}

$\sigma^2 = 55206 \times 10^{-6}$

$\sigma = 23496 \times 10^{-6}$

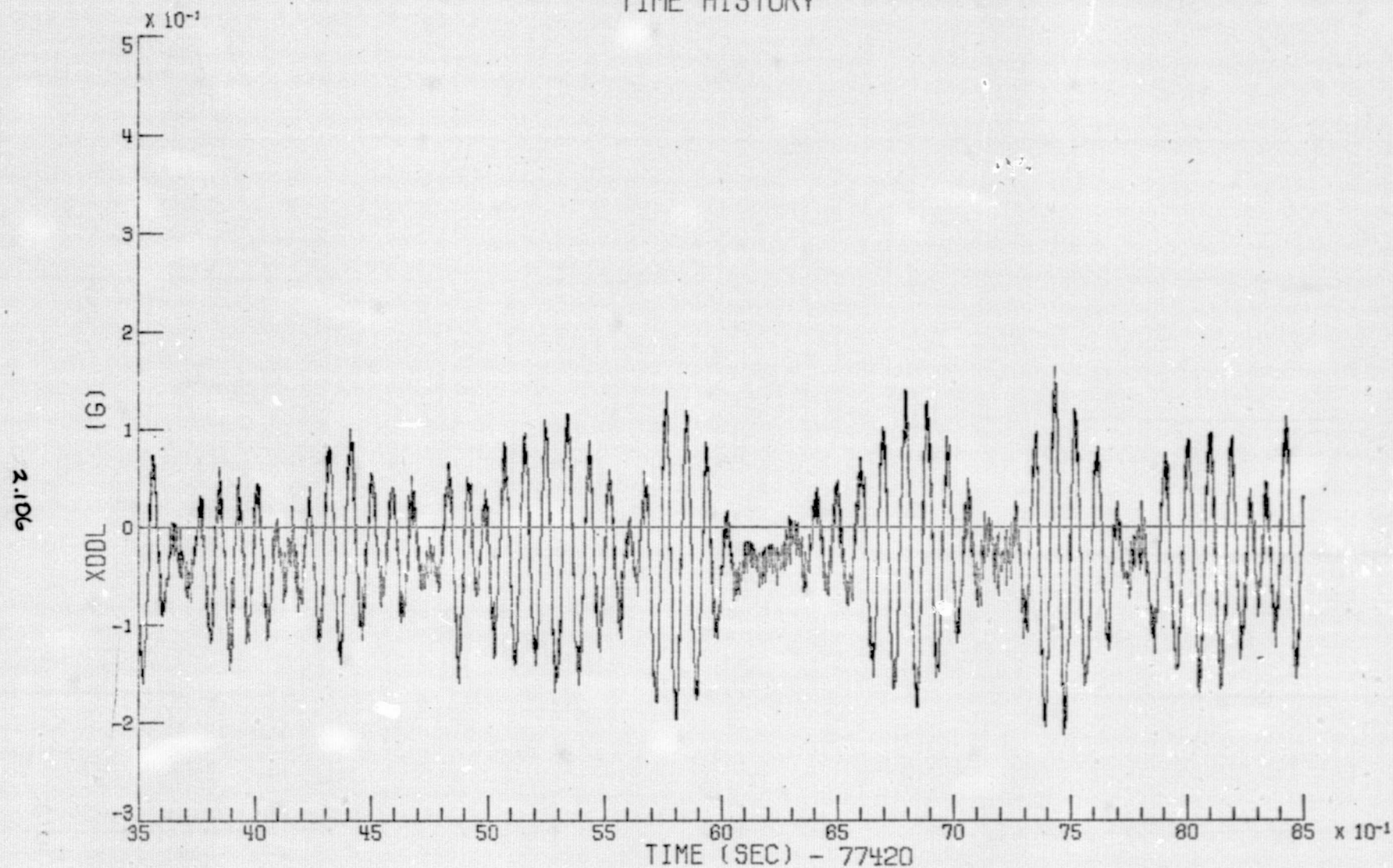
$3\sigma = 70488 \times 10^{-6}$

VIKING A FLT (GBI)

CENT BURN 1-2.4

CY1850

TIME HISTORY



MAX = .162

MIN = -.212

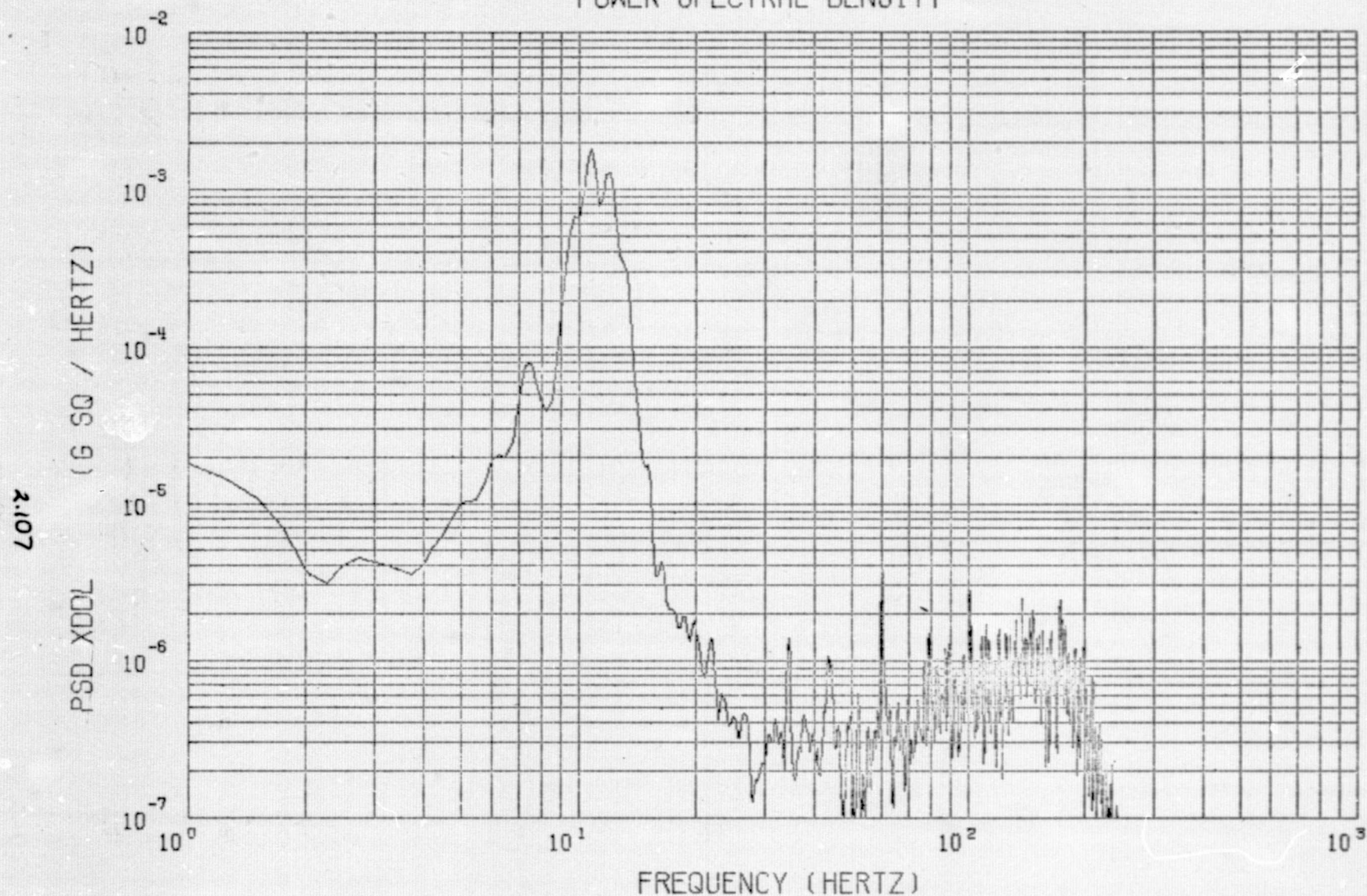
→ $\pm .1878$

VIKING A FLT (GBI)

CENT BURN 1-2.4

XDDL

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77423.500 SEC

STOP = 77428.500 SEC

MEAN = -30473×10^{-6}

$\sigma^2 = 41294 \times 10^{-7}$

$\sigma = 6426 \times 10^{-5}$

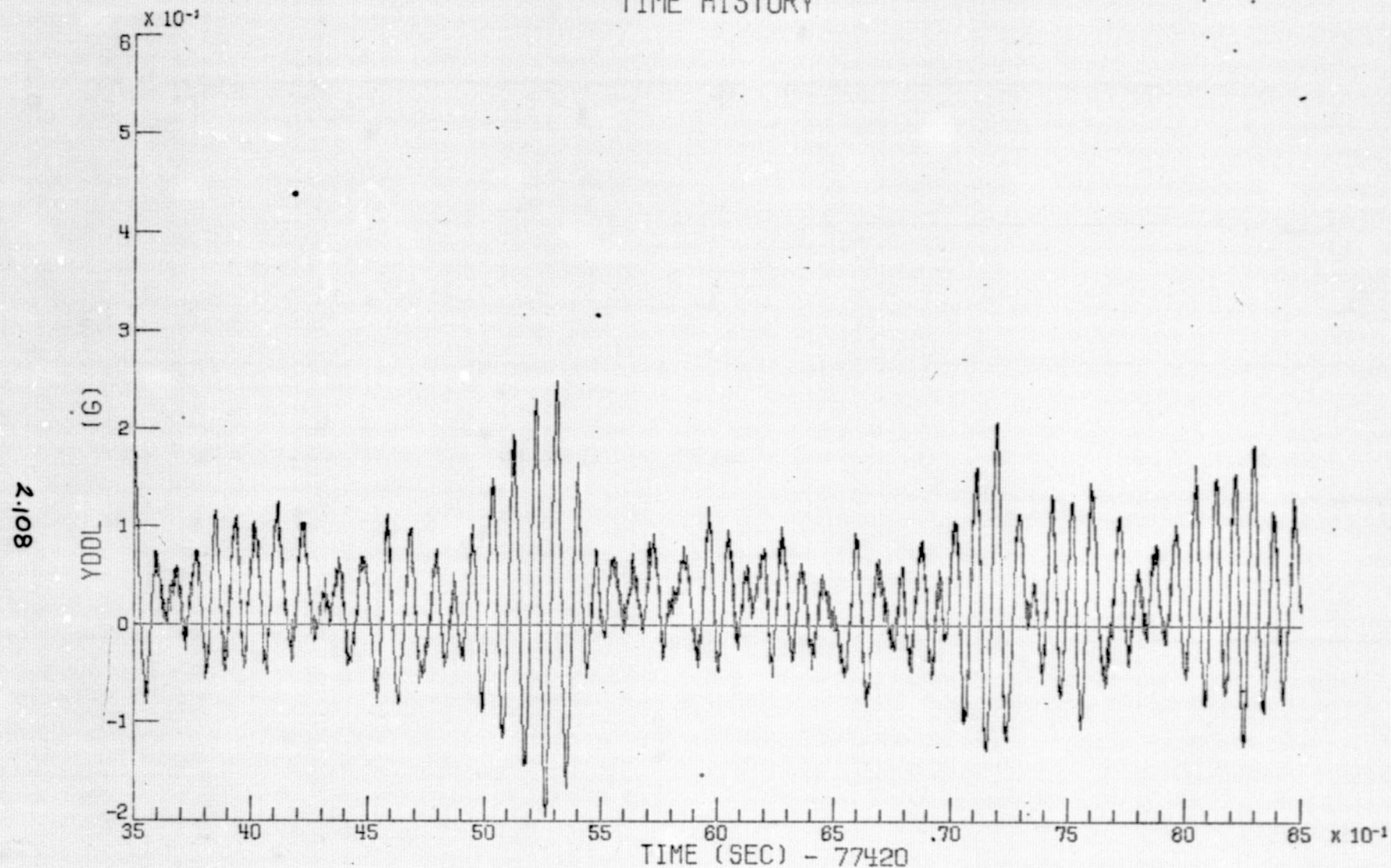
$3\sigma = 19278 \times 10^{-5}$

VIKING A FLT (GBI)

CENT BURN 1-2.4

XDDL

TIME HISTORY



MAX = .249

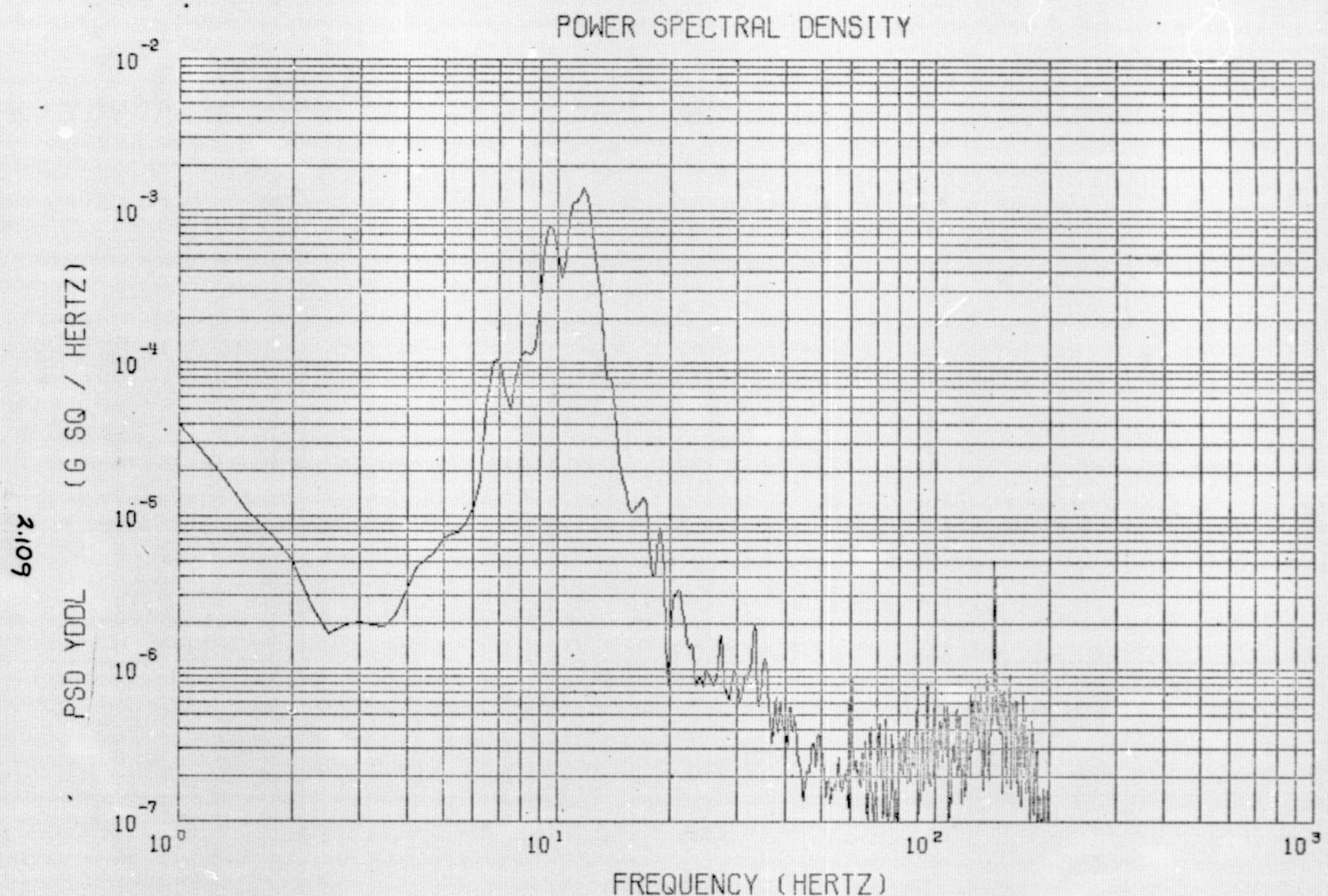
MIN = -.195

→ $\pm .222 g$

VIKING A FLT (GBI)

CENT BURN 1-2.4

YDDL



$\Delta F = .250$

START = 77423.500 SEC

STOP = 77428.500 SEC

MEAN = 23896×10^{-5}

$\sigma^2 = 38232 \times 10^{-7}$

$\sigma = 61832 \times 10^{-6}$

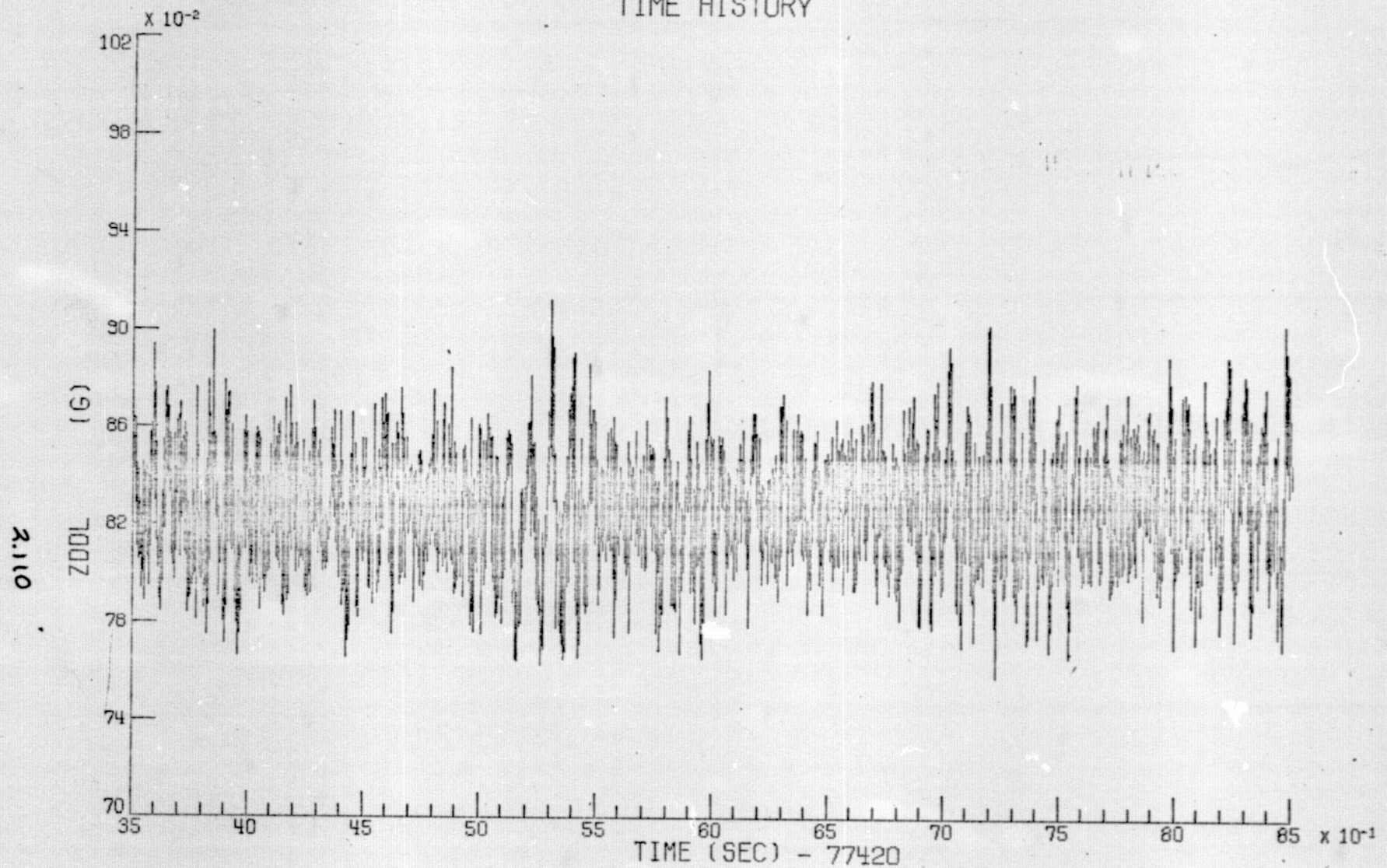
$3\sigma = 18549 \times 10^{-5}$

VIKING A FLT (GBI)

CENT BURN 1-2.4

YDDL

TIME HISTORY



MAX = .912

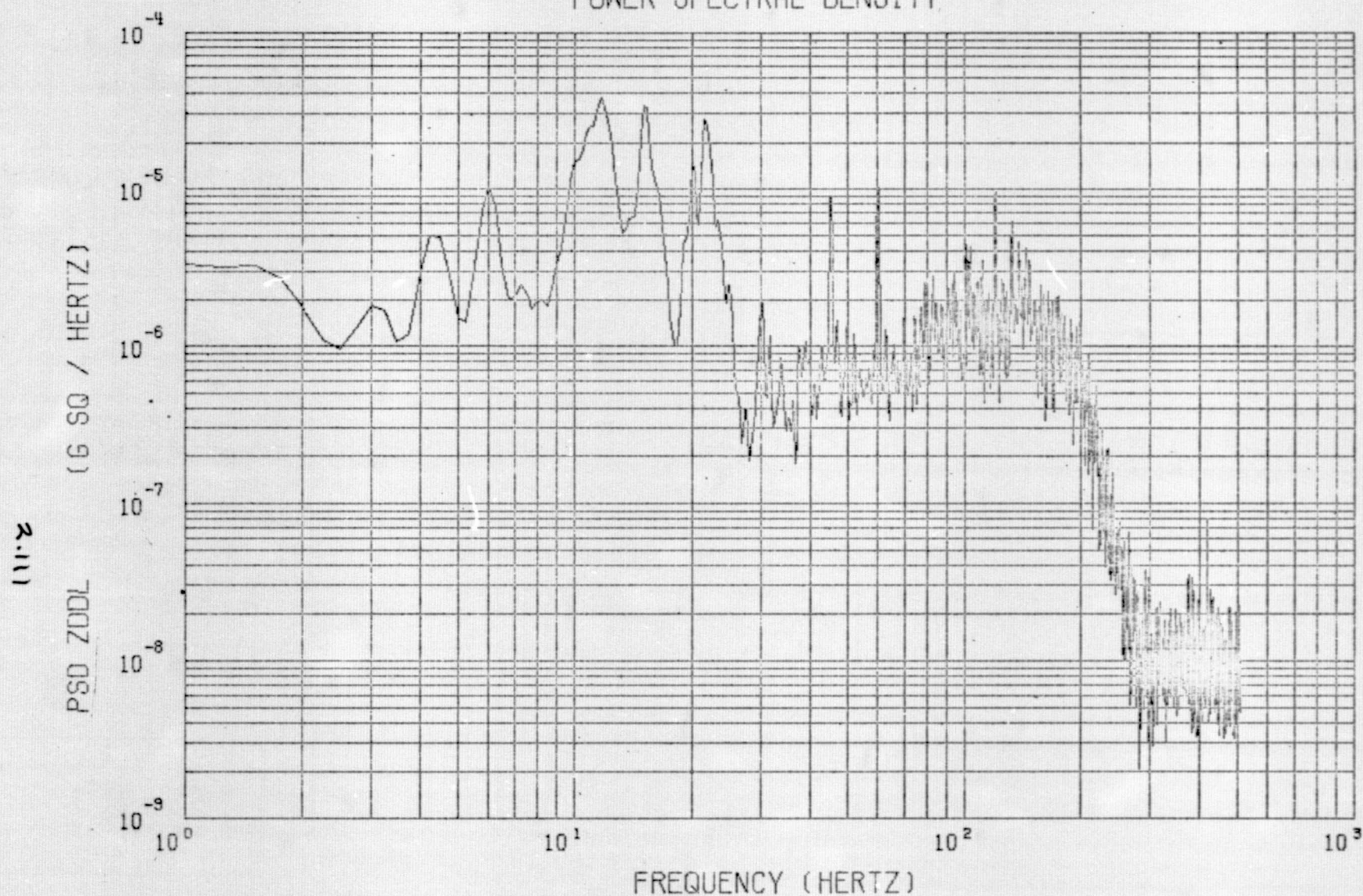
MIN = .758 $\rightarrow \pm .077g$

VIKING A FLT (GBI)

CENT BURN 1-2.4

ZDDL

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77423.500 SEC

STOP = 77428.500 SEC

MEAN = 82759×10^{-5}

$\sigma^2 = 47216 \times 10^{-8}$

$\sigma = 21729 \times 10^{-6}$

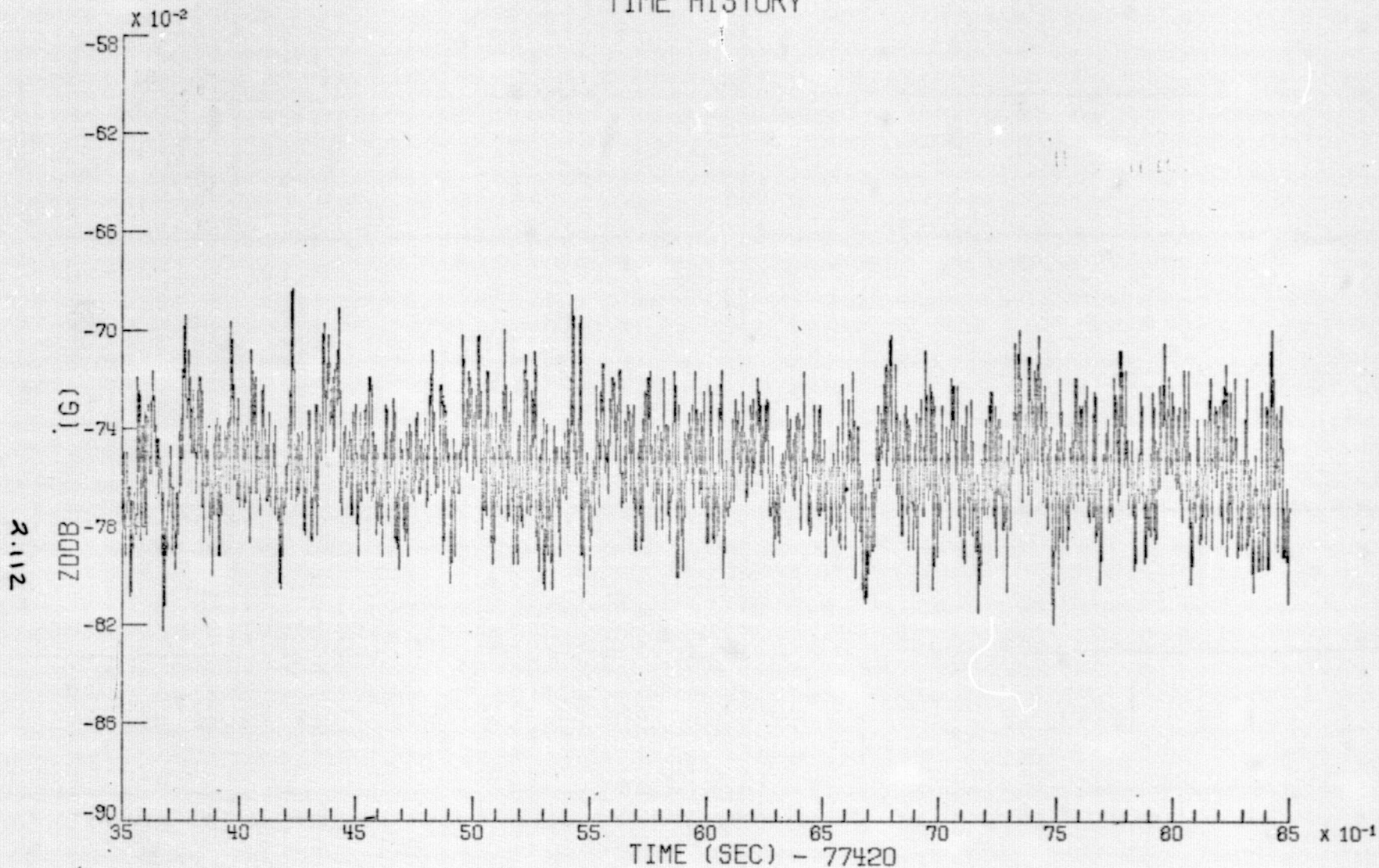
$3\sigma = 65188 \times 10^{-6}$

VIKING A FLT (GBI)

CENT BURN 1-2.4

ZDDL

TIME HISTORY



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OF POOR QUALITY

MAX = -.682

MIN = -.822

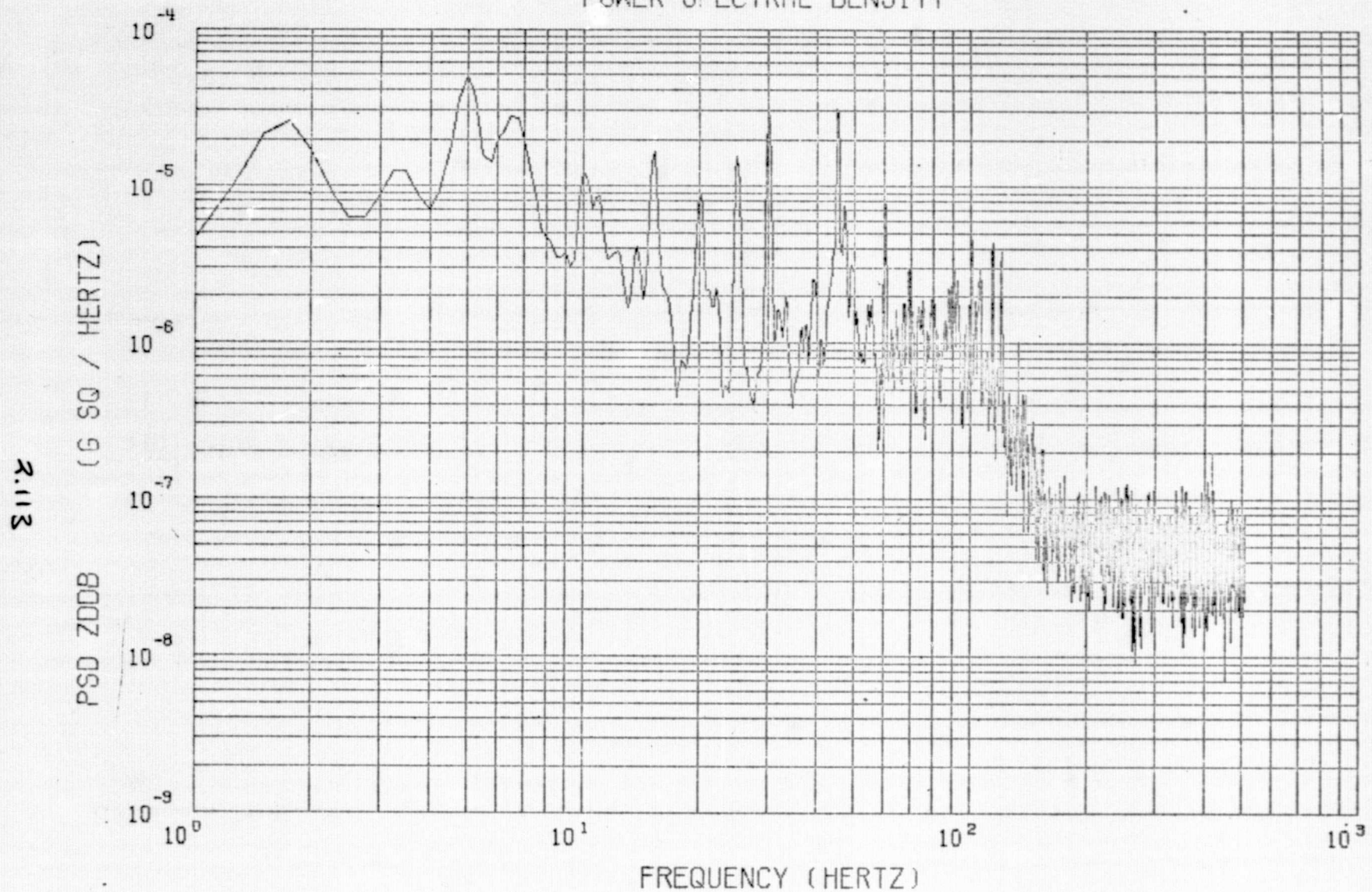
→ ± .070

VIKING A FLT (GBI)

CENT BURN 1-2.4

ZODB

POWER SPECTRAL DENSITY



$\Delta F = .250$

START = 77423.500 SEC

STOP = 77428.500 SEC

MEAN = -75454×10^{-5}

$\sigma^2 = 39634 \times 10^{-5}$

$\sigma = 19921 \times 10^{-5}$

$3\sigma = 59763 \times 10^{-5}$

VIKING A FLT (GBI)

CENT BURN 1-2.4

ZODB